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Framework Convention on Climate Change

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Report on the individual review of the annual submission of Czechia submitted in 2017*

Note by the expert review team

Summary

Each Party included in Annex I to the Convention must submit an annual greenhouse gas (GHG) inventory covering emissions and removals of GHG emissions for all years from the base year (or period) to two years before the inventory due date (decision 24/CP.19). Parties included in Annex I to the Convention that are Parties to the Kyoto Protocol are also required to report supplementary information under Article 7, paragraph 1, of the Kyoto Protocol with the inventory submission due under the Convention. This report presents the results of the individual inventory review of the 2017 annual submission of Czechia, conducted by an expert review team in accordance with the "Guidelines for review under Article 8 of the Kyoto Protocol". The review took place from 4 to 9 September 2017 in Prague, Czechia.

* In the symbol for this document, 2017 refers to the year in which the inventory was submitted, not to the year of publication.

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Abbreviations and acronyms

2006 IPCC Guidelines	*2006 IPCC Guidelines for National Greenhouse Gas Inventories*
AAU	assigned amount unit
AD	activity data
Annex A sources	source categories included in Annex A to the Kyoto Protocol
AR	afforestation and reforestation
Article 8 review guidelines	"Guidelines for review under Article 8 of the Kyoto Protocol"
AWMS	animal waste management system
B_o	maximum methane producing potential
CER	certified emission reduction
CH_4	methane
CM	cropland management
CO_2	carbon dioxide
CO_2 eq	carbon dioxide equivalent
CPR	commitment period reserve
CRF	common reporting format
CSC	carbon stock change
CzSO	Czech Statistical Office
EF	emission factor
ERT	expert review team
ERU	emission reduction unit
EU ETS	European Union Emissions Trading System
F-gas	fluorinated gas
F_I	stock change factor for forest type I
F_{LU}	land-use factor
FM	forest management
F_{MG}	stock change factor for management
FMP	forest management plan
FMRL	forest management reference level
$F_{NON-CON}$	factor for non-consumed protein added to wastewater
$Frac_{GASF}$	fraction of synthetic fertilizer nitrogen that volatilizes as ammonia and nitrogen oxides
$Frac_{GASM}$	fraction of applied organic nitrogen fertilizer materials and of urine and dung nitrogen deposited by grazing animals that volatilizes as ammonia and nitrogen oxides
$Frac_{LEACH-(H)}$	fraction of all nitrogen added to or mineralized in managed soils that is lost through leaching and run-off
$Frac_{LEACH-MS}$	fraction of managed manure nitrogen losses due to run-off and leaching during solid and liquid storage of manure
$Frac_{REMOVE}$	fraction of above-ground residues of a crop that is removed annually for purposes such as feed, bedding and construction
GHG	greenhouse gas
GM	grazing land management
HFC	hydrofluorocarbon
HWP	harvested wood products
IEF	implied emission factor
IPCC	Intergovernmental Panel on Climate Change
IPCC good practice guidance	*Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories*

IPCC good practice guidance for LULUCF	*Good Practice Guidance for Land Use, Land-Use Change and Forestry*
IPPU	industrial processes and product use
KP-LULUCF activities	activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol
Kyoto Protocol Supplement	*2013 Revised Supplementary Methods and Good Practice Guidance Arising from the Kyoto Protocol*
LULUCF	land use, land-use change and forestry
MCF	methane conversion factor (for manure management)
MSW	municipal solid waste
N	nitrogen
NA	not applicable
NE	not estimated
Nex	nitrogen excretion
NFI	national forest inventory
NF_3	nitrogen trifluoride
NH_3	ammonia
NIR	national inventory report
NO	not occurring
NOx	nitrogen oxides
N_2O	nitrous oxide
NR	not reported
PFC	perfluorocarbon
QA/QC	quality assurance/quality control
RMU	removal unit
RV	revegetation
SEF	standard electronic format
SF_6	sulphur hexafluoride
SIAR	standard independent assessment report
SWDS	solid waste disposal site
TOW	total organic waste
UNFCCC Annex I inventory reporting guidelines	"Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part I: UNFCCC reporting guidelines on annual greenhouse gas inventories"
UNFCCC review guidelines	"Guidelines for the technical review of information reported under the Convention related to greenhouse gas inventories, biennial reports and national communications by Parties included in Annex I to the Convention"
WDR	wetland drainage and rewetting
Wetlands Supplement	*2013 Supplement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories: Wetlands*
Ym	methane conversion factor (for enteric fermentation)

I. Introduction[1]

1. This report covers the review of the 2017 annual submission of Czechia organized by the secretariat, in accordance with the Article 8 review guidelines (decision 22/CMP.1, as revised by decision 4/CMP.11). In accordance with the Article 8 review guidelines, this review process also encompasses the review under the Convention as described in the UNFCCC review guidelines, particularly in part III thereof, namely the "UNFCCC guidelines for the technical review of greenhouse gas inventories from Parties included in Annex I to the Convention" (decision 13/CP.20). The review took place from 4 to 9 September 2017 in Prague, Czechia, and was coordinated by Mr. Roman Payo (secretariat). Table 1 provides information on the composition of the ERT that conducted the review of Czechia.

Table 1
Composition of the expert review team that conducted the review of Czechia

Area of expertise	*Name*	*Party*
Generalist	Ms. Songli Zhu	China
Energy	Mr. Peter Seizov	Bulgaria
IPPU	Mr. Menouer Boughedaoui	Algeria
Agriculture	Mr. Daniel Bretscher	Switzerland
LULUCF	Mr. Max Collett	Australia
Waste	Mr. Takefumi Oda	Japan
Lead reviewers	Ms. Zhu	
	Mr. Bretscher	

2. The basis of the findings in this report is the assessment by the ERT of the consistency of the Party's 2017 annual submission with the Article 8 review guidelines. The ERT has made recommendations that Czechia resolve the findings related to issues,[2] including issues designated as problems.[3] Other findings, and, if applicable, the encouragements of the ERT to Czechia to resolve them, are also included.

3. A draft version of this report was communicated to the Government of Czechia, which provided comments that were considered and incorporated, as appropriate, into this final version of the report.

4. Annex I shows annual GHG emissions for Czechia, including totals excluding and including the LULUCF sector, indirect CO_2 emissions and emissions by gas and by sector. Annex I also contains background data related to emissions and removals from KP-LULUCF activities, if elected, by gas, sector and activity for Czechia.

5. Information to be included in the compilation and accounting database can be found in annex II.

[1] At the time of publication of this report, Czechia had submitted its instrument of ratification of the Doha Amendment; however, the amendment had not yet entered into force. The implementation of the provisions of the Doha Amendment is therefore considered in this report in the context of decision 1/CMP.8, paragraph 6, pending the entry into force of the amendment.

[2] Issues are defined in decision 13/CP.20, annex, paragraph 81.

[3] Problems are defined in decision 22/CMP.1, annex, paragraphs 68 and 69, as revised by decision 4/CMP.11.

II. Summary and general assessment of the 2017 annual submission

6. Table 2 provides the assessment by the ERT of the annual submission with respect to the tasks undertaken during the review. Further information on the issues identified, as well as additional findings, may be found in tables 3 and 5.

Table 2
Summary of review results and general assessment of the inventory of Czechia

Assessment			*Issue or problem ID#(s) in table 3 and/or 5[a]*
Dates of submission	Original submission: 12 April 2017 (NIR), 13 April 2017, Version 2 (CRF tables), 12 April 2017 (SEF-CP2-2016), 18 May 2017 (SEF-CP1-2016) Revised submissions: 5 May 2017, Version 4 (CRF tables), 18 May 2017 (SEF-CP2-2016) Unless otherwise specified, the values from the latest submission are used in this report		
Review format	In-country		
Application of the requirements of the UNFCCC Annex I inventory reporting guidelines and Wetlands Supplement (if applicable)	1. Have any issues been identified in the following areas:		
	(a) Identification of key categories	Yes	G.4, G.13
	(b) Selection and use of methodologies and assumptions	Yes	E.9, I.11, I.12, A.28, A.36, W.12, KL.16
	(c) Development and selection of EFs	Yes	E.9, I.17, I.22, A.25, A.27, A.31, L.15, L.17, W.13, W.15
	(d) Collection and selection of AD	Yes	E.17, E.19, I.13, A.19, A.32, A.34,A.35, A.37, A.38,W.10, W.11, KL.2
	(e) Reporting of recalculations	No	
	(f) Reporting of a consistent time series	Yes	A.3, A.34
	(g) Reporting of uncertainties, including methodologies	Yes	G.9, L.12
	(h) QA/QC	QA/QC procedures were assessed in the context of the national system (see para. 2 in this table)	
	(i) Missing categories/completeness[b]	Yes	E.13, I.1, I.2, I.15, I.21, I.23, A.34, L.3, L.19, W.12, KL.5
	(j) Application of corrections to the inventory	No	
Significance threshold	For categories reported as insignificant, has the Party provided sufficient information showing that the likely level of emissions meets the criteria in paragraph 37(b) of the UNFCCC Annex I inventory reporting guidelines?	No	L.18, L.14
Description of trends	Did the ERT conclude that the description in the NIR of the trends for the different gases and sectors is reasonable?	Yes	

Assessment			*Issue or problem ID[a](s) in table 3 and or 5[a]*
Supplementary information under the Kyoto Protocol	2. Have any issues been identified related to the national system:		
	(a) The overall organization of the national system, including the effectiveness and reliability of the institutional, procedural and legal arrangements	No	
	(b) Performance of the national system functions	Yes	G.10, G.14
	3. Have any issues been identified related to the national registry:		
	(a) Overall functioning of the national registry	No	
	(b) Performance of the functions of the national registry and the technical standards for data exchange	No	
	4. Have any issues been identified related to reporting of information on ERUs, CERs, AAUs and RMUs and on discrepancies reported in accordance with decision 15/CMP.1, annex, chapter I.E, taking into consideration any findings or recommendations contained in the SIAR?	No	
	5. Have any issues been identified in matters related to Article 3, paragraph 14, of the Kyoto Protocol, specifically problems related to the transparency, completeness or timeliness of reporting on the Party's activities related to the priority actions listed in decision 15/CMP.1, annex, paragraph 24, including any changes since the previous annual submission?	Yes	G.1
	6. Have any issues been identified related to the reporting of KP-LULUCF activities:		
	(a) Reporting requirements in decision 2/CMP.8, annex II, paragraphs 1–5	Yes	KL.3, KL.7, KL.8, KL.9, KL.10, KL.14
	(b) Demonstration of methodological consistency between the reference level and reporting on FM in accordance with decision 2/CMP.7, annex, paragraph 14	Yes	KL.14, KL.16
	(c) Reporting requirements of decision 6/CMP.9	Yes	KL.12, KL.16
	(d) Country-specific information to support provisions for natural disturbances, in accordance with decision 2/CMP.7, annex, paragraphs 33 and 34	NA	
CPR	Was the CPR reported in accordance with the annex to decision 18/CP.7, the annex to decision 11/CMP.1 and decision 1/CMP.8, paragraph 18?	No	G.2
Adjustments	Has the ERT applied an adjustment under Article 5, paragraph 2, of the Kyoto Protocol?	No	
	Did the Party submit a revised estimate to replace a previously applied adjustment?	NA	The Party does not have a previously applied adjustment
Response from the Party during the review	Has the Party provided the ERT with responses to the questions raised, including the data and information necessary for the assessment of conformity with the UNFCCC Annex I inventory reporting guidelines and any further guidance adopted by the Conference of the Parties?	Yes	

Assessment			*Issue or problem ID#(s) in table 3 and or 5[a]*
Recommendation for an exceptional in-country review	On the basis of the issues identified, does the ERT recommend that the next review be conducted as an in-country review?	No	
Questions of implementation	Did the ERT list a question of implementation?	No	

[a] The ERT identified additional issues and/or problems in all sectors and for KP-LULUCF activities that are not listed in this table but are included in table 3 and/or 5.

[b] Missing categories for which methods are provided in the 2006 IPCC Guidelines may affect completeness and are listed in annex III.

III. Status of implementation of issues and/or problems raised in the previous review report

7. Table 3 compiles all the recommendations made in previous review reports that were included in the previous review report, published on 31 August 2017.[4] For each issue and/or problem, the ERT specified whether it believes the issue and/or problem has been resolved by the conclusion of the review of the 2017 annual submission and provided the rationale for its determination, which takes into consideration the publication date of the previous review report and national circumstances.

Table 3
Status of implementation of issues and/or problems raised in the previous review report of Czechia

ID#	*Issue and/or problem classification[a]*	*Recommendation made in previous review report*	*ERT assessment and rationale*
General			
G.1	Article 3, paragraph 14, of the Kyoto Protocol (G.9, 2016) (G.9, 2015) (108, 2014) Adherence to the UNFCCC Annex I inventory reporting guidelines	Report any changes in the information provided under Article 3, paragraph 14, of the Kyoto Protocol in accordance with decision 15/CMP.1, annex, chapter I.H, and/or further relevant decisions of the Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol.	Addressing. The Party has updated the information on the minimization of adverse impacts provided in its NIR (table 15-1 and chapter 15, paragraphs (a), (d) and (f)). However, the Party did not specify what changes were made since the previous submission. During the review, the Party acknowledged that the changes were made in the areas identified in decision 15/CMP.1, annex, paragraph 24(a), (d) and (f). The ERT noted that the changes include: a feasibility and impact analysis to end by 2018 for the introduction of a carbon tax; four projects focusing on pilot CO_2 capture and storage technologies for coal-fired power plants approved in 2015; and a new cooperation with developing country Parties in diversifying their energy mix.
G.2	CPR (G.15, 2016) (G.15, 2015) Adherence to reporting guidelines under Article 7, paragraph 1, of the Kyoto Protocol	Calculate and report the CPR correctly.	Not resolved. The Party reported its CPR in the NIR (p.378) as 495,463,683 t CO_2 eq, or 90 per cent of its assigned amount. However, the ERT noted an error in the calculation, because 90 per cent of the Party's assigned amount equals 468,463,683 t CO_2 eq (0.90 x 520,515,203 = 468,463,683). During the review, the Party acknowledged the error and agreed with the CPR calculated by the ERT.

[4] FCCC/ARR/2016/CZE.

ID[a]	*Issue and/or problem classification*[b]	*Recommendation made in previous review report*	*ERT assessment and rationale*
G.3	Inventory management (G.10, 2016) (G.10, 2015) Transparency	Include an organization chart of the institutes involved in the emissions inventory compilation, and an explanation of the chart.	Resolved. The Party included the organization chart in the NIR (p.21).
G.4	Key category analysis (G.11, 2016) (G.11, 2015) Adherence to the UNFCCC Annex I inventory reporting guidelines	Provide in the NIR a key category analysis that is prepared in accordance with the 2006 IPCC Guidelines.	Not resolved. The ERT noted that key categories are identified up to (but not including) the first category that steps over the 95 per cent threshold (approach 1) and 90 per cent threshold (approach 2) (NIR tables 1-12 and 1-13, pp.42 and 43). During the review, the Party explained that in approach 1 it paid increased attention to the categories up to 97 per cent. However, the ERT noted that the Party did not identify the categories that lie between 95 and 97 per cent as key. The Party confirmed that it will correct the cut-off criteria for the key category analysis; that is, it will identify the first categories that step over the 95 and 90 per cent ranges as key in the next submission.
G.5	Key category analysis (G.12, 2016) (G.12, 2015) Adherence to the UNFCCC Annex I inventory reporting guidelines	Use 1990 as the base year for the key category analysis and uncertainty analysis.	Resolved. For the key category analysis and the uncertainty analysis, the base year for SF_6 has been changed to 1990 (84.10 Gg CO_2 eq) from 1995 (85.22 Gg CO_2 eq). The ERT noted that HFCs, PFCs and NF_3 are reported as "NO" for 1990.
G.6	KP-LULUCF supplementary information (G.15, 2016) (G.15, 2015) Transparency	Conduct QA/QC procedures on the reporting elements under the Kyoto Protocol.	Not resolved. No specific QA/QC procedure on the reporting elements under the Kyoto Protocol was mentioned in part II of the NIR (supplementary information required under Article 7, paragraph 1, of the Kyoto Protocol). During the review, the Party explained that QA/QC procedures for this information are similar to the procedures for the LULUCF sector reported in chapter 1.2.3.5.6 (p.35) of the NIR, and presented the QA/QC procedures for information required under the Kyoto Protocol.
G.7	Kyoto Protocol units (G.14, 2016) (G.14, 2015) Adherence to the reporting guidelines under Article 7, paragraph 1, of the Kyoto Protocol	Include a disaster recovery plan in line with document FCCC/SBI/2015/10.	Resolved. No updated disaster recovery plan was mentioned in the NIR. The ERT noted that the Czech national registry is part of the consolidated system of European registries. During the review, the Party provided the ERT with the recovery plan and explained that it had not received this document from the administrator of the consolidated system of European registries in time to submit it with the 2017 NIR. Based on the SIAR 2017 and the information provided during the review, the ERT considers that this issue has been resolved.

ID[a]	Issue and/or problem classification[b]	Recommendation made in previous review report	ERT assessment and rationale
G.8	Uncertainty analysis (G.6, 2016) (G.6, 2015) (table 4, 2014) Adherence to the UNFCCC Annex I inventory reporting guidelines	Report the uncertainty analysis both including and excluding the LULUCF sector.	Resolved. The Party reported the uncertainty analysis, both including and excluding the LULUCF sector, in the NIR (annex II, pp.433 and 444).
G.9	Uncertainty analysis (G.13, 2016) (G.13, 2015) Transparency	Include explanatory information on the source of the uncertainty values for EFs for all categories included in categories 4.A–4.G reported in chapter 1.6 of and annex 2 to the NIR.	Not resolved. The ERT noted that for categories 4.A–4.G the AD uncertainty is still reported as zero with no accompanying explanation. During the review, the Party explained that the uncertainty value reported for the EFs represents the combined uncertainty for AD and EFs. The Party also explained that this will be described in the next submission, specifically in NIR chapter 1.6.
Energy			
E.1	General (energy sector) (E.2, 2016) (E.2, 2015) (21, 2014) (21, 2013) Transparency	Provide a full elaboration of the method of expert judgment used to improve the uncertainty values.	Resolved. The Party has reported on the method of expert judgment in chapter 3.2.5 of the NIR.
E.2	Fuel combustion – reference approach (E.21, 2016) (E.20, 2015) Transparency	Provide an explanation of the differences in CO_2 emissions between the reference and the sectoral approaches when they are higher than 2 per cent.	Addressing. The Party has reported the differences (NIR chapter 3.2.1) but not reported on the possible reasons for the differences higher than 2 per cent in the emission estimates between the reference and the sectoral approach (particularly for 1990, 1991 and 2004, where the differences were 4.5, 4.2 and –4.6 per cent, respectively). During the review, the Party provided more information on the main reasons (statistical differences and distribution losses) as well as a quantification of the differences.
E.3	1.A Fuel combustion – sectoral approach – solid fuels – N_2O (E.11, 2016) (E.11, 2015) Transparency	Update the text in the NIR to document the application of the default EF of 1.5 kg/TJ for solid fuels.	Resolved. The Party reported (NIR chapter 3.2.7.5, p.77) the application of the default EF of 1.5 kg/TJ.
E.4	1.A.1.a Public electricity and heat production – other fossil fuels (MSW) – CH_4 (E.12, 2016) (E.12, 2015) Accuracy	Calculate and report CH_4 emissions applying the default EF from the 2006 IPCC Guidelines of 30 kg/TJ or another EF in accordance with the 2006 IPCC Guidelines EF selection (volume 2, table 2.2).	Resolved. The Party reported (NIR chapters 3.2.7.5.1 and 3.2.15.5, pp.79 and 109) that the default EF from the 2006 IPCC Guidelines has been used in the estimations.
E.5	1.A.1.a Public electricity and heat production – other fossil fuels (MSW) – CO_2 and N_2O (E.13, 2016)	Update the text in the NIR to document the application of the default EFs of 91.7 kg/TJ for CO_2 emissions and 4 kg/TJ for N_2O emissions for alternative fuels (MSW).	Resolved. The Party reported (NIR chapter 3.2.7.5.1, p.79) that the default EFs have been used in the estimations.

ID[a]	Issue and/or problem classification[b]	Recommendation made in previous review report	ERT assessment and rationale
	(E.13, 2015) Transparency		
E.6	1.A.1.b Petroleum refining – liquid fuels – N_2O (E.14, 2016) (E.14, 2015) Transparency	Update the text in the NIR to document the application of the default EF of 0.1 kg/TJ for N_2O emissions.	Resolved. The Party reported (NIR chapter 3.2.8.5, p.82) that the default EF has been used in the estimations.
E.7	1.A.2.f Non-metallic minerals – other fossil fuels – CH_4 and N_2O (E.15, 2016) (E.15, 2015) Transparency	Update the text in the NIR to document the application of the default EF of 30 kg/TJ and 4 kg/TJ for CH_4 and N_2O emissions, respectively, for alternative fuels used in the cement industry.	Resolved. The Party explained in its NIR (chapter 3.2.15.5, p.108) that the default EFs have been used in the estimations.
E.8	1.A.3.b Road transportation – liquid fuels – CO_2, CH_4 and N_2O (E.16, 2016) Accuracy	Update the text in the NIR to document how it is ensured that AD for the latest reported year are correct and the time series is consistent.	Resolved. The Party reported (NIR chapters 3.2.17.3, p.125, 3.2.17.5, p.129) on QA/QC procedures to ensure the accuracy of the AD for the latest reported year. The ERT did not identify any issues with the AD for the latest reported year or with the time-series consistency.
E.9	1.A.3.b Road transportation – liquid fuels – CO_2 (E.17, 2016) (E.16, 2015) Accuracy	Use a tier 2 approach to estimate CO_2 emissions from liquid fuels in road transportation, applying a country-specific carbon content for fuels, since CO_2 emissions from road transportation (liquid fuels) is identified as a key category and so it is good practice to apply a tier 2 approach for the emission estimates.	Not resolved. The Party has not updated the emission estimation methodology to tier 2, but it has reported it as a planned improvement in the NIR (chapter 3.2.17.6, p.130). During the review, the Party explained that its first priority would be to introduce the COPERT emission calculation model for the 2018 submission, and the transition to a tier 2 methodology for estimating CO_2 emissions (including developing a country-specific carbon content) would be implemented after that. The ERT noted that the calculation of CO_2 emissions using the COPERT model requires the amount of fuel combusted and a wide range of country-specific fuel properties (including net calorific value and hydrogen to carbon and oxygen to carbon ratios). Therefore the establishment of country-specific fuel properties is required for the application of the COPERT model.
E.10	1.B.1.a Coal mining and handling – solid fuels – CH_4 (E.10, 2016) (E.10, 2015) (32, 2014) Consistency	Ensure time-series consistency in historical data used to estimate the emissions from solid fuels (underground mines).	Resolved. The Party reported (NIR chapter 3.3.1.2, pp.152 and 153) on the methodology to ensure time-series consistency. The ERT did not identify any issues with the time series of historical data used to estimate the emissions from solid fuels (underground mines).
E.11	1.B.1.a Coal mining and handling – solid fuels – CH_4 (E.18, 2016) (E.17, 2015) Transparency	Update the text in the NIR to document the application of the default EF of 1.675 kg/t for CH_4 emissions from post-mining activities for underground mines.	Resolved. The Party explained in its NIR (chapter 3.3.1.5, p.158) that it used the default EF in the estimations.
E.12	1.B.1.a Coal mining	Update the text in the NIR to	Resolved. The Party reported (NIR chapter 3.3.1.5,

ID[a]	Issue and or problem classification[a]	Recommendation made in previous review report	ERT assessment and rationale
	and handling – solid fuels – CH_4 (E.19, 2016) (E.18, 2015) Transparency	document the application of the default EF of 1.34 kg/t for CH_4 emissions from mining activities in surface mines.	p.158) that it used the default EF in the estimations.
E.13	1.B.2.a Oil – liquid fuels – CO_2 and CH_4 (E.20, 2016) (E.19, 2015) Completeness	Change the notation key for oil exploration to "NE" and indicate in both the NIR and the CRF completeness table why those emissions or removals have not been estimated. Provide in the NIR a justification for the exclusion in terms of the likely level of emissions in accordance with paragraph 37(b) of the UNFCCC Annex I inventory reporting guidelines.	Not resolved. The Party reported (both in NIR chapter 3.3.2.1 and in CRF table 1.B.2) oil and gas exploration as "NO" for the latest years and not significant for the beginning of the time series. However, the ERT noted that there is some publicly available information from several companies claiming that they conduct hydrocarbon exploration operations. For example: the Lama Energy Group website (http://www.lamagroup.cz/en/lama-gas-oil) indicates that "Lama Gas & Oil successfully continues with the exploration of new crude oil and natural gas deposits in the Party and is planning production in other places in the South Moravian Region"; and the MND Group website (http://www.mnd.eu/en/oil-gas-production/geological-structure-of-mnd-exploration-areas/) indicates that "MND a.s. conducts hydrocarbon exploration operations within this area on the basis of three exploration licences – Slopes of the Bohemian Massif, Vienna Basin VIII and Vizovice Hills". During the review, the Party obtained additional information from those companies, clarifying that only one of the companies has a valid exploration permit, under which it is currently performing only seismic surveys, with no drilling activities occurring, and that the other does not conduct exploration activities. The ERT agrees with the Party's decision to report emissions from oil and gas exploration activities as "NO" for recent years. However, it is not clear whether this is valid for the entire time series. For example, the production of crude oil increased significantly during the period 1990–2003 (from 2,082 TJ in 1990 to 13,294 TJ in 2003), which might be a result of oil exploration activities being carried out at that time. The ERT believes that this issue should be considered further in future reviews to confirm there is not an underestimation of emissions.
IP[b]			
I.1	2.A.4 Other process uses of carbonates – CO_2 (I.10, 2016) (I.10, 2015) Completeness	Collect the missing AD for 1990–2006 on mineral wool production and estimate and report CO_2 emissions.	Addressing. The Party reported information on mineral wool production (NIR pp.180–182) but reported AD for 1990–1999 as "NO" in NIR table 4-7 (AD are now reported for 2000–2015). During the review, the Party explained that it is assessing whether mineral wool production occurred during 1990–1999 and will report on its assessment in its next submission.
I.2	2.B.7 Soda ash	Undertake comprehensive	Not resolved. The Party reported (NIR p.193,

ID#	Issue and or problem classification[a]	Recommendation made in previous review report	ERT assessment and rationale
	production – CO_2 (I.11, 2016) (I.11, 2015) Completeness	surveys to ensure that possible emissions from soda ash production are covered in the national inventory for the whole time series and report the outcome of the studies.	chapter 4.3.7) that soda ash is not produced in Czechia, but, compared with in the 2016 NIR, did not provide any additional information to explain what was done to confirm that information. The ERT believes that this issue should be considered further in future reviews to confirm there is not an underestimation of emissions.
I.3	2.C.1 Iron and steel production – CO_2 (I.2, 2016) (I.2, 2015) (38, 2014) (54, 2013) Transparency	Include information in the NIR on the changes in iron and steel processes.	Addressing. The Party reported (NIR pp.197–200) more information related to iron and steel production. However, the information requested in the recommendation is still missing (transparently documenting the evolution of the IEFs in the NIR and explaining the development of the ratios of production technologies; namely, the ratio of electric arc furnaces, of traditional iron works, of recycling of scrap iron and of electric arc-based melting technologies) (see ID# I.18 in table 5).
I.4	2.C.2 Ferroalloys production – CO_2 and CH_4 (I.12, 2016) (I.12, 2015) Completeness	Include the AD and CO_2 and CH_4 emissions from ferroalloys production or report them as "NO" if there is no production of ferroalloys in the years 2004–2007.	Resolved. The Party reported emissions from ferroalloys production for the entire time series (NIR pp.200 and 201). There is only one producer of ferrovanadium and therefore the AD are reported as confidential.
I.5	2.C.3 Aluminium production – CO_2, CH_4 and PFCs (I.3, 2016) (I.3, 2015) (46, 2014) Transparency	Include in the NIR information justifying why the CO_2, CH_4 and PFC emissions are reported as "NO", together with an explanation of the 'cover salts' (fluxes) method.	Addressing. The NIR (p.213) indicates that primary aluminium production does not occur in Czechia, but this information is reported under category 2.F (product uses as substitutes for ozone-depleting substances) and not under category 2.C.3 (aluminium production) or in the general part on metal industry (category 2.C). Further, there is no discussion of the cover salts method in the NIR. The ERT notes that reporting of CH_4 emissions is not mandatory.
I.6	2.C.3 Aluminium production – CO_2 and PFCs (I.13, 2016) (I.13, 2015) Transparency	Indicate in the NIR that primary aluminium production has not occurred in the time series since 1990.	Resolved. The Party reported (NIR p.213) that primary aluminium production has not occurred since 1990.
I.7	2.C.3 Aluminium production – CO_2 and PFCs (I.13, 2016) (I.13, 2015) Comparability	Report CO_2 and PFC emissions from secondary aluminium production in the correct category (2.C.7 other) to ensure comparability among Parties.	Resolved. The ERT noted that the 2006 IPCC Guidelines do not include a methodology to estimate CO_2 or PFC emissions from secondary aluminium production.
I.8	2.C.5 Lead production – CO_2 (I.14, 2016) (I.14, 2015) Transparency	Update the text in its NIR to document the application of the default EF of 0.2 t CO_2/t lead for secondary lead production.	Resolved. The Party reported (NIR p.202; CRF table 2(I).A–Hs2) the correct EF and emissions for lead production.
I.9	2.C.6 Zinc production – CO_2 and CH_4	Include the AD and CO_2 and CH_4 emissions from zinc	Resolved. The Party reported (NIR pp.203 and 204) that there is only one secondary zinc production

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	(I.12, 2016) (I.12, 2015) Completeness	production or report them as "NO" if there is no production in the years 1990–2007.	plant operating since 1998. CO_2 emissions are reported but AD are reported as confidential. CH_4 emissions from zinc production are not required to be reported.
I.10	2.E.1 Integrated circuit or semiconductor – HFCs, PFCs and SF_6 (I.4, 2016) (I.4, 2015) (43, 2014) Transparency	Identify the number of producers of semiconductors, add a description of the trend in F-gas emissions (reasons for the gaps in and cessation of the use of F-gases) and provide details of the method and EFs used.	Resolved. The Party reported information on the producers and on the method and EFs used (NIR chapter 4.6.2, p.210). The NIR (p.209) explains that this activity began in 1997.
I.11	2.F. Product uses as substitutes for ozone-depleting substances – HFCs, PFCs and SF_6 (I.5, 2016) (I.5, 2015) (40, 2014) Accuracy	Consistently implement the new methods, data sources and EFs for the estimation of emissions from refrigeration and mobile air conditioning and transparently document the underlying information in the NIR, specifying, in particular, from which subcategories (domestic, commercial, industrial and transport refrigeration, mobile and stationary air conditioning) the emissions come and providing documentation on the AD sources, lifetimes and EFs used.	Addressing. The Party reported the data and methodology used to estimate F-gas emissions for different subcategories (NIR p.212). During the review, the Party explained that it developed a new model to estimate F-gas emissions where input data are collected from ISPOP (the official reporting system of the Ministry of Environment) and the F-gas register and through surveys and customs. However, there is still missing information, in particular related to the reporting of AD (see ID# I.20 in table 5).
I.12	2.F. Product uses as substitutes for ozone-depleting substances – HFCs, PFCs and SF_6 (I.6, 2016) (I.6, 2015) (41, 2014) Accuracy	Describe in the NIR how the percentage of the F-gases captured and the percentage of the F-gases emitted are identified and explain the storage of large amounts of F-gases practised in the country.	Addressing. The NIR (p.212) indicates that most of the F-gas emissions (e.g. 99.0 per cent for 2015) are HFC emissions from category 2.F.1. The NIR (chapter 4.7.1.2) indicates that a new model is being used and data are collected through the F-gas register and ISPOP. During the review, the Party explained that the new model and associated data gathering will improve the accuracy of the information on the percentage of F-gases captured, stored and emitted.
I.13	2.F.1 Refrigeration and air conditioning – HFCs and PFCs (I.16, 2016) (I.16, 2015) Accuracy	Provide in the NIR an explanation of AD, customs statistics and ISPOP data in order to prove the completeness of the estimation of F-gas emissions from imported products.	Addressing. The NIR (chapter 4.7.1.2) indicates that a new model is being used to estimate F-gas emissions for this category. However, the Party did not report any evidence of the completeness of AD collected from customs and ISPOP and the F-gas register. During the review, the Party explained that the new model is a work in progress. Efforts will be made to collect more data and assure national coverage of all F-gas sources. This will be reported in the next submission. The ERT believes that this issue should be considered further in future reviews to confirm there is not an underestimation of emissions.
I.14	2.G.2 SF_6 and PFCs from other product use – SF_6	Justify the trend in the emissions of SF_6 from stocks for soundproof windows in the	Resolved. As the Party reported (NIR p.223) and further clarified during the review, SF_6 has been replaced since 1990 by N and argon and is no

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	(I.8, 2016) (I.8, 2015) (44, 2014) Transparency	NIR.	longer used in soundproof windows. Emissions occur only from stocks.
I.15	2.G.2 SF_6 and PFCs from other product use – PFCs and SF_6 (I.9, 2016) (I.9, 2015) (45, 2014) Completeness	Further investigate any possible other uses of PFCs and SF_6 (military, scientific or other), and, if they occur, estimate and report these emissions to ensure completeness of the estimates.	Addressing. During the review, the Party explained that an investigation is being conducted to collect data and information for this subcategory and that the results will be included in the next submission. During the review, the ERT identified many activities occurring in Czechia that may use SF_6 and PFCs. Examples include activities associated with the particle accelerator is the Nuclear Physics Institute (Tanderon) (http://neutron.ujf.cas.cz), which is still active, the military industry producing radars and drones (VERA) (http://www.era.cz/military-security/vera-ng), radiotherapy centres (e.g. Proton Therapy Center) (http://www.proton-cancer-treatment.com) and a major company manufacturing shoes (Bata). Such activities have not been considered for their use of SF_6 or PFCs. The ERT believes that this issue should be considered further in future reviews to confirm there is not an underestimation of emissions.
I.16	2.G.2 SF_6 and PFCs from other product use – SF_6 (I.17, 2016) (I.17, 2015) Completeness	Undertake comprehensive surveys to ensure that possible emissions from the use of SF_6 in double-glazed soundproof windows are covered in the national inventory for the whole time series and report the outcome of the studies.	Resolved (see ID# I.14 above).
Agriculture			
A.1	3. General (agriculture) (A.2, 2016) (A.2, 2015) (49, 2014) Adherence to the UNFCCC Annex I inventory reporting guidelines	Enforce the sector-specific QA/QC analysis and report on the category-specific checks and results in the category-specific subchapters of the NIR.	Not resolved. The Party did not describe the category-specific QA/QC checks in sufficient detail (e.g. by providing differences between IEF and default values and rationale for these differences) and did not report on the respective results in the NIR.
A.2	3. General (agriculture) (A.16, 2016) (A.16, 2015) Adherence to the UNFCCC Annex I inventory reporting guidelines	Correct the reported ratios for: CH_4 emissions from enteric fermentation; and the contribution of other farm animals to the CH_4 emissions from enteric fermentation.	Resolved. The Party reported the correct values (NIR chapter 5.2.1).
A.3	3.A Enteric fermentation – CH_4 (A.3, 2016) (A.3, 2015) (52, 2014)	Correct the erroneous reporting of the values for body weights in the NIR (table 5-4) and transparently describe how time-series consistency is	Not resolved. The Party did not transparently report the values for body weight in the NIR and the description of the time-series consistency for non-dairy cattle (calves, bulls and heifers) is not sufficiently transparent in the NIR for the ERT to

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	Consistency	assured in the relevant subchapter of the NIR.	assess whether the Party has reported a consistent time series (see ID# A.4 below).
A.4	3.A.1 Cattle – CH_4 (A.17, 2016) (A.17, 2015) Transparency	Increase transparency by including some of the assumptions behind gross energy estimation (body weight, daily weight gain, pregnancy percentage, share of milk energy for calves) in the NIR and a whole time series of gross energy values on a livestock subcategory level in order to explain fluctuating EFs for non-dairy cattle.	Not resolved. The Party did not report sufficient information to increase transparency in the NIR. During the review, the Party provided a spreadsheet with detailed data (body weight, daily weight gain, pregnancy percentage, share of milk energy for calves) on a livestock subcategory level that could be included and further explained in the NIR.
A.5	3.A.1 Cattle – CH_4 (A.17, 2016) (A.17, 2015) Transparency	Report the feeding situation and weighted pregnancy percentage in the CRF tables (not reported in the 2016 submission) and explain the values in the NIR.	Addressing. The Party reported the feeding situation and weighted pregnancy percentage for non-dairy cattle in CRF table 3.As2. However, the ERT considers that the values are not explained sufficiently transparently in the NIR (see ID# A.4 above).
A.6	3.B Manure management – CH_4 (A.6, 2016) (A.6, 2015) (57(b), 2014) Transparency	Provide the data used to estimate the weighted EF for non-dairy cattle on an animal subcategory level in the NIR, including livestock population statistics, body weight, excretion of volatile solids, B_o and AWMS allocation.	Not resolved. The Party did not report the data used to estimate the weighted EF for non-dairy cattle on an animal subcategory level in the NIR.
A.7	3.B Manure management – CH_4 (A.18, 2016) (A.18, 2015) Transparency	Improve the transparency of the reporting of the CH_4 EF for swine by including in the NIR the information provided that the Party's average annual temperature is lower than 10 °C, and that the respective default parameter was chosen for this temperature.	Not resolved. The Party did not report the average annual temperature as a rationale for using the respective default parameter in the NIR.
A.8	3.B Manure management – CH_4 and N_2O (A.20, 2016) (A.20, 2015) Transparency	Provide in the NIR transparent information on the sources of data for AWMS distribution for non-cattle species.	Not resolved. The Party did not report transparent information on the sources of data for AWMS distribution for non-cattle species in the NIR.

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A.9	3.B Manure management – CH_4 (A.7, 2016) (A.7, 2015) (57(c), 2014) Transparency	Provide in the NIR all background information on the development of agricultural policies and structures that support the trends in AWMS allocation.	Addressing. The Party reported some information (NIR chapter 5.2.2). However, the ERT considers that the provided information is still not sufficiently transparent to resolve the issue. The NIR did not describe, for example, the distinct drop in the use of liquid systems during the 1995–2003 period (from 23 per cent in 1995 to 10–15 per cent in 1996–2001 to 26 per cent in 2003). For non-dairy cattle, the share of pasture, range and paddock increases from 12 per cent in 1990 to 25 per cent in 2015. During the review, the Party stated that these changes reflect the development in agriculture in the country. The very intensive farming after World War II had changed by the end of the twentieth century into more extensive farming on grasslands. Furthermore, the Party explained that the distribution of manure management systems is based on a 2011 expert judgment based on information obtained through questionnaires (see ID# A.26 in table 5).
A.10	3.B Manure management – CH_4 and N_2O (A.21, 2016) (A.21, 2015) Consistency	Provide an explanation for the expert judgment on AWMS distribution not being updated after 2010 (for dairy cattle) and 2011 (for non-dairy cattle), and if necessary update these values to ensure time-series consistency.	Resolved. The ERT considers that providing data on AWMS distribution for an interval of 5–10 years is sufficient and agrees with the Party that the amount of resources necessary for more frequent data collection is not justified by the respective increase in accuracy (see ID# A.26 in table 5).
A.11	3.B Manure management – CH_4 (A.19, 2016) (A.19, 2015) Transparency	Include the MCFs for dairy and non-dairy cattle in CRF table 3.B(a)s2, and for swine if tier 2 methods are applied.	Resolved. The Party reported the MCF values for dairy and non-dairy cattle in CRF table 3.B(a)s2. A tier 1 method is applied for swine.
A.12	3.B Manure management – N_2O (A.22, 2016) (A.22, 2015) Accuracy	Investigate the reason why the Nex rates for dairy and non-dairy cattle are higher than the rates that would be calculated using the default method of the 2006 IPCC Guidelines and provide the explanation in the NIR.	Resolved. The Party revised the Nex rates for dairy and non-dairy cattle and the methodology is explained in the NIR (pp.239–241).
A.13	3.B Manure management – N_2O (A.23, 2016) (A.23, 2015) Adherence to the UNFCCC Annex I inventory reporting guidelines	Correct the Nex values for livestock other than cattle reported in table 5-16 in the NIR and improve the QA/QC procedure for reporting in the NIR and the CRF tables to ensure the consistency of the Nex values reported.	Resolved. The Party reported the correct values in NIR table 5-16. The Nex values are consistent between the NIR and the CRF tables, suggesting that QA/QC procedures have been improved.
A.14	3.B.1 Cattle – CH_4 (A.24, 2016) (A.24, 2015) Transparency	Clarify in the NIR which MCFs are derived from which source.	Not resolved. The Party did not transparently report the data source for MCF values for cattle in the NIR. During the review, the Party clarified that the MCF values used for liquid system and solid

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			storage suggested by Dämmgen et al. (2012) are actually the same as the default values in table 10.17 of the 2006 IPCC Guidelines.
A.15	3.B.3 Swine – CH_4 (A.25, 2016) (A.25, 2015) Adherence to the UNFCCC Annex I inventory reporting guidelines	Consider swine a significant species for manure CH_4 emissions and apply a tier 2 method to estimate CH_4 from manure management for swine.	Addressing. The Party still used a tier 1 method. The contribution of swine to the emissions from manure management is 30 per cent and 10 per cent for CH_4 and N_2O emissions, respectively. During the review, the Party explained that it is planning to address this matter during future submissions and will include it in its inventory development plan. See ID# A.29 in table 5.
A.16	3.B.5 Indirect N_2O emissions – N_2O (A.26, 2016) (A.26, 2015) Accuracy	Use a $Frac_{LEACH-MS}$ in accordance with the 2006 IPCC Guidelines and provide estimations for the whole time series.	Resolved. The Party reported indirect N_2O emissions from manure management as "NE". The ERT considers that this is in line with the 2006 IPCC Guidelines (volume 4, page 10.56), which state that emissions for this category should only be included in a tier 2 approach if country-specific estimates for $Frac_{LEACH-MS}$ are available.
A.17	3.D.a.4 Crop residues – N_2O (A.27, 2016) (A.27, 2015) Transparency	Update the text in the next NIR to document the application of $Frac_{REMOVE}$ as zero.	Resolved. The Party reported $Frac_{REMOVE}$ as zero in NIR table 5-23.
A.18	3.D.a.5 Mineralization/ immobilization associated with loss/gain of soil organic matter – N_2O (A.28, 2016) (A.28, 2015) Transparency	Update the text in the next NIR to document the application of equation 11.8 from the 2006 IPCC Guidelines and the estimation of the annual amount of N that is mineralized from loss of soil organic carbon in mineral soils with the carbon to N ratio value as 15 and the EF for N_2O emissions from N inputs as 0.01.	Resolved. The Party estimated N_2O emissions from mineralization of soil organic matter and described the methodology in the NIR (p.229), consistent with the 2006 IPCC Guidelines.
A.19	3.D.b Indirect N_2O emissions from managed soils – N_2O (A.13, 2016) (A.13, 2015) (63, 2014) (68, 2013) Transparency	Improve reporting of indirect emissions from soils by, for example, harmonizing the reporting of NH_3 emissions to different international bodies or by using well-documented national data.	Addressing. The Party improved the reporting of indirect emissions from soils (see ID# A.20 below). However, the harmonization progress is limited (only the consistent use of livestock population data) (see ID# A.36 in table 5).
A.20	3.D.b Indirect N_2O emissions from managed soils – N_2O (A.29, 2016) (A.29, 2015) Transparency	Update the text in the NIR to document the application of equations 11.9 and 11.10 from the 2006 IPCC Guidelines and describe the method transparently in the NIR with the calculation worksheet provided as supplementary information.	Resolved. The Party updated the text in the NIR (pp.247 and 248) and documented the method.

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LULUCF			
L.1	4. General (LULUCF) (L.1, 2016) (L.1, 2015) (69, 2014) (72, 2013) (87, 2012) Accuracy	Develop country-specific reference carbon stocks values/change factors (e.g. F_{LU}, F_{MG}, F_I) associated with the tillage and input regimes for the estimates of CSC in mineral soils.	Resolved. The Party has developed country-specific reference carbon stocks values for forest land, cropland and grassland (NIR p.270, figure 6-10). During the review, the Party provided weighted average carbon stock values (bracketed numbers are the standard deviations) for these areas as at 2015: 66.5 (13.7), 58.5 (12.2) and 68.2 (14.8) t carbon/ha for category 4.A, 4.B and 4.C, respectively. The Party has also developed a country-specific value for F_{MG} for cropland and grassland. During the review, the Party explained that because 4.B, 4.C and 4.A.2 are not key categories, it would require a disproportionate effort to develop country-specific factors for all stock change factors. The ERT agrees with this assessment. During the review, the Party noted that it intends to report more disaggregated AD and land-use information on cropland and grassland in the 2018 or 2019 submission (see ID#s L.15 and L.17 in table 5).
L.2	4. General (LULUCF) (L.5, 2016) (L.5, 2015) Comparability	Report the correct area of organic soils in CRF tables 4.A–F.	Resolved. The Party has reported an area of 18.67 kha organic soils for forest land (CRF table 4.A), with organic soils listed as "NO" for the other land-use categories. The NIR (pp.274, 278 and 281) indicates that organic soils mainly occur as peatlands in mountainous regions of forest land, and do not occur or are insignificant for other land-use categories. During the review, the Party confirmed that the soil carbon mapping used in the NIR (figure 6-10) indicates that organic soils do not occur outside of forest lands.
L.3	4.A.1 Forest land remaining forest land – CO_2 (L.2, 2016) (L.2, 2015) (71, 2014) (76, 2013) (90, 2012) Completeness	Use the results of the next NFI, when they are available, to estimate the CSC in the dead organic matter pool.	Addressing. The Party reported in the NIR (p.261) that there have now been two cycles of the NFI and the CzechTerra inventories, which were used as auxiliary sources of information, but that the inventory is still based on the FMP data. The Party also used information on dead organic matter stocks from these inventories to support the assessment in the NIR (p.371) that this pool is not a source, and can be excluded from the reporting of FM under the Kyoto Protocol. During the review, the Party explained that it plans to use the auxiliary data to report estimates for the dead organic matter pool in the 2018 submission. This may include either CzechTerra or NFI data depending on an assessment of the most appropriate and accurate data for inventory use. The ERT noted that the Party may choose the most appropriate AD, consistent with the 2006 IPCC Guidelines (volume 1, chapter 2).
L.4	4.A.2 Land converted to forest land – CO_2 (L.4, 2016) (L.4, 2015) (73, 2014) (79, 2013)	Revise the biomass increment value for above-ground biomass in land converted to forest land once the information	Resolved. During the review, the Party explained that the NFI data are not yet available for accurate reporting of biomass increments for land converted to forest land; however, increment values are

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	(93 and 115, 2012) Accuracy	from the ongoing NFI becomes available.	calculated on the basis of the comprehensive standwise reporting of FMPs. During the review, the Party explained that no species composition information is known until newly converted forests are included in FMP reporting (on average five years), and therefore weighted average increment information is required, as described in the NIR (p.268). The Party further explained that once reported, species-specific increments are used. The Party also explained that increments are calculated for young stands, as described in the NIR (p.268), because increments are not reported in FMPs for young stands until a merchantable diameter of 7 cm is reached, typically after 17 years. The ERT agreed with the Party's assessment that the best available data are already used, based on a comprehensive, standwise inventory of FMPs. The ERT considers that the use of NFI data to determine the species composition of newly converted forest land is not necessary.
L.5	4.B.1 Cropland remaining cropland – CO_2 (L.6, 2016) (L.6, 2015) Accuracy	Complete the work to develop country-specific reference carbon stock values/change factors associated with the tillage and input regimes and use the updated EF according to national circumstances in CM practices for calculations in the next submission.	Resolved (see ID# L.1 above).
Waste			
W.1	5.A Solid waste disposal on land – CH_4 (W.2, 2016) (W.2, 2015) (78, 2014) (84, 2013) Transparency	Improve the transparency of the inventory by including in the NIR the information that in Czechia waste legislation was established before the European Union landfill directive and that management conditions of landfills were gradually improving even before 1990, together with a description of the national legislation concerning landfill management practices.	Not resolved. The Party has not provided in the NIR any historical information on the national legislation concerning landfill management practices (including legislation established before the European Union landfill directive) and did not provide sufficient support for the expert judgment on methane correction factors prior to 1990. During the review, the Party provided further explanations, but did not provide any evidence to support the assumption that there were no emissions from unmanaged landfill sites in 1990 (AD reported as "NO" in CRF table 5.A).
W.2	5.A Solid waste disposal on land – CH_4 (W.3, 2016) (W.3, 2015) (79, 2014) (85, 2013) Transparency	Improve the transparency of the inventory and include in the NIR waste composition data, including the degradable organic carbon values, for 1950–1989.	Not resolved. The NIR did not include information on waste composition for the years 1950–1989. During the review, the Party explained that it used the default waste composition for Eastern Europe from the 2006 IPCC Guidelines (table 2.3, volume 5) for 1950–1989.
W.3	5.A Solid waste disposal on land – CH_4 (W.4, 2016) (W.4, 2015) (79, 2014)	Update the information on waste composition for the years 1950–1989.	Not resolved. The NIR did not include information on waste composition for the years 1950–1989.

ID[a]	Issue and or problem classification[b]	Recommendation made in previous review report	ERT assessment and rationale
	(85, 2013) Accuracy		
W.4	5.C.1 Waste incineration – CO_2, CH_4 and N_2O (W.5, 2016) (W.5, 2015) (83, 2014) (91, 2013) Transparency	Improve the transparency of the inventory and include in the NIR information regarding the decreasing trend in waste incinerated.	Not resolved. The Party has not reported any trend information on waste incineration in the NIR. During the review, the Party explained that it is preparing a structural decomposition analysis to identify the drivers of emissions in the waste sector (including waste incineration) from 1990 onward.
W.5	5.C.1 Waste incineration – CO_2 (W.7, 2016) (W.7, 2015) Transparency	Correct the information in NIR table 7-12 on the source of the CO_2 EF for hazardous/industrial waste incineration.	Not resolved. According to the NIR (p.301), the estimate of CO_2 emissions from hazardous/industrial waste incineration is based on default values from the 2006 IPCC Guidelines. However, the factors in NIR table 7-12 (carbon fraction 0.5) are not the default values presented in table 5.2 of the 2006 IPCC Guidelines (total carbon content in per cent of dry weight 50 per cent (industrial waste), 60 per cent (clinical waste), 40–50 per cent (sewage sludge)). NIR table 7-12 shows the default EF in table 5.6 of the IPCC good practice guidance. During the review, the Party explained that the information in NIR table 7-12 was outdated and that the factors used in the calculations were from the 2006 IPCC Guidelines.
W.6	5.D.1 Domestic wastewater – N_2O (W.8, 2016) (W.8, 2015) Transparency	Provide in the NIR documentation on the value used for $F_{NON\text{-}CON}$ and the rationale for choosing the EF.	Resolved. The NIR (p.306) explains that the applied value for $F_{NON\text{-}CON}$ (1.25) is the average of the default factor for developed countries (1.4) and developing countries (1.1) from the 2006 IPCC Guidelines, to reflect the evolution of the Czech wastewater treatment system.
W.7	5.D.1 Domestic wastewater – CH_4 (W.9, 2016) (W.9, 2015) Transparency	Include a detailed description of the calculation of CH_4 emissions from domestic wastewater in the NIR.	Not resolved. The NIR (chapter 7.5.1.2) includes the same description of the estimations as the previous NIR. The ERT also found some additional transparency issues (see ID#s W.14 and W.15 in table 5).
W.8	5.D.2 Industrial wastewater – CH_4 (W.10, 2016) (W.10, 2015) Accuracy	Provide in the NIR information on the expert judgment regarding CH_4 recovery and flaring to ensure that there is not an underestimation of emissions for the latest years.	Resolved. The Party reported the data source for the amount of CH_4 recovered (NIR p.309), which is obtained on an annual basis from statistics on renewable energy from the Ministry of Industry and Trade. The ERT identified neither an under- nor overestimation of CH_4 recovery for the latest years.
KP-LULUCF			
KL.1	General (KP-LULUCF) – CO_2 (KL.1 and KL.3, 2016) (KL.1 and KL.3, 2015) (86, 2014) (93, 2013) Transparency	Report the correct notation key "NR" in CRF table NIR-1 for the deadwood pool, which is reported as "NO" in CRF table 5(KP-I)B.1.	Not resolved. The Party reported the deadwood pool in CRF table NIR-1. The Party stated in the NIR (p.371) that it intends not to account for this pool and provided information to demonstrate that this pool is not a net source (as described in decision 2/CMP.7, annex, para. 26). The ERT considers that the appropriate notation key would be "NE" in CRF table 4(KP-I)B.1 and "NR" in CRF table NIR-1. During the review, the Party explained that it will use the best available auxiliary data sets

ID#	Issue and or problem classification[a]	Recommendation made in previous review report	ERT assessment and rationale
			(e.g. CzechTerra or NFI, as described in the NIR (p.261)) to report estimates for this pool (see ID# KL.15 in table 5).
KL.2	AR – CO_2, CH_4 and N_2O (KL.4, 2016) (KL.4, 2015) Accuracy	Provide information on biomass burning in AR areas and if it occurs report the associated emissions.	Addressing. The Party stated in the NIR that biomass burning is confined to FM lands (p.370), and that CH_4 and N_2O emissions from burning are not estimated for land converted to forest land under the Convention because the practice is not employed in Czechia (p.269). During the review, the Party explained that the available AD for biomass burning from wildfires are not spatially explicit and, although this statistical information is complete (in the sense that all burned biomass is accounted for), it is not possible to accurately allocate the AD between AR and FM areas. The Party also explained that it applies expert judgment to allocate all of the AD to FM lands. The Party noted that allocating a proportion of these AD to AR could result in an underestimate of emissions from biomass burning if fuel loads for younger stands (e.g. AR) were applied to fires actually occurring in mature stands (e.g. FM lands) (because the fuel loads for younger stands are lower than for mature stands). During the review, the Party explained that spatially explicit AD for biomass burning will be available through a project with the Czech Ministry of Interior (2017–2021). The Party intends to use these improved AD, when available, in future submissions.
KL.3	Deforestation – CO_2 (KL.2, 2016) (KL.2, 2015) (87 and 89, 2014) (94, 97 and 98, 2013) Accuracy	Improve the tracking of deforested lands, including information on subsequent land-use changes and the management practices applied to them.	Not resolved. During the review, the Party explained that the NFI is not yet available, and instead the ongoing digitization of cadastral data will provide the best data for tracking deforested lands in accordance with decision 2/CMP.7, annex, paragraph 24. The Party also explained that, although the cadastral information used for identifying KP-LULUCF activities under reporting method 1 (pp.2.18 and 2.19 of the Kyoto Protocol Supplement) is very detailed with elements of reporting method 2 (since 2003 it has been based on gross land-use changes within a year calculated at the level of individual land parcels), it has not so far been possible to track land subject to KP-LULUCF activities over time below the level of the cadastral units (more than 13,000 units, mean area 6.1 km^2). The Party also explained that there is an digitalization project under way to provide fully digitized wall-to-wall coverage of cadastral land-use information that will allow accurate tracking over time of land subject to KP-LULUCF activities (e.g. if reforestation occurs on previously deforested land, which the Party explained that for administrative reasons was unlikely to occur). The Party further explained that there is a planned improvement to use a sample of already digitized

ID#	Issue and/or problem classification[a]	Recommendation made in previous review report	ERT assessment and rationale
			areas to track land and subsequent land-use changes using statistical approaches consistent with the Kyoto Protocol Supplement (pp.2.18 and 2.19). The ERT notes that the Party's land identification system has exceeded the requirements for reporting method 1 of the Kyoto Protocol Supplement (by tracking gross land-use changes at the level of individual land parcels) since 2003 but does not currently track each land parcel over subsequent years. The ERT agreed with the Party's assessment that the cadastral data are likely to be more appropriate for improving the tracking of deforested lands (see ID# KL.10 in table 5).
KL.4	Deforestation – CO_2 (KL.5, 2016) (KL.5, 2015) Transparency	Include in the NIR the description of how AD for deforestation were collected for increased transparency and increase ongoing efforts to complete the NFI in order to implement the results in the next GHG inventory.	Resolved. The Party reported in chapter 11.2 of the NIR how AD on deforestation were collected, based on the land identification system used for reporting under the Convention, described in chapter 6.2 of the NIR. The Party also explained in the NIR (p.275) how data from the auxiliary data sources, including initial results from the NFI and CzechTerra landscape inventory, are used to estimate carbon stocks prior to conversion. During the review, the Party explained that the digitization of cadastral information will permit tracking of lands over time, including secondary conversions back to forest (see ID# KL.3 above).
KL.5	FM – CO_2 (KL.6, 2016) (KL.6, 2015) Completeness	Assess whether CSC in deadwood occurs and if necessary report the CSC on the basis of the NFI.	Addressing. The Party reported CSC in deadwood as "NO" in CRF table 4(KP-I)B.1. However, in the NIR (p.372), the Party estimated the likely CSC in deadwood using data from the NFI and CzechTerra. During the review, the Party explained that new data (not available at the time the 2017 submission was compiled) are already available from the second cycle of sampling from the CzechTerra programme, and that this may provide better data for inventory reporting than the NFI. During the review, the Party explained that it will use updated information from the forest sampling programmes (e.g. NFI or CzechTerra, as described in the NIR p.261) to report on CSC in dead organic matter in the 2018 inventory submission.
KL.6	HWP – CO_2 (KL.7, 2016) (KL.7, 2015) Transparency	Include in the NIR information on the category split of HWP, with additional explanatory text.	Resolved. The Party provided an additional explanation of the reporting of HWP from AR included with HWP from FM in the NIR (p.374), consistent with the Kyoto Protocol Supplement (page 2.118). An explanation is provided in the NIR (pp.287 and 374) of how HWP from deforestation events are identified and reported based on instantaneous oxidation, and the amount of HWP from such events are reported in CRF table 4(KP-I)C.
KL.7	HWP – CO_2 (KL.8, 2016) (KL.8, 2015)	Extend the part of the NIR that describes the development of the FMRL and HWP, for	Not resolved. NIR chapter 11.5.3.2 has not been changed since the previous NIR. The Party has not included detailed information that describes the

ID[a]	Issue and/or problem classification[a]	Recommendation made in previous review report	ERT assessment and rationale
	Transparency	increased transparency.	development of the FMRL in relation to HWP in NIR section 11.5.3.2, including that the HWP contribution to the FMRL was estimated based on first-order decay methods. During the review, the Party provided additional information that it intends to include in the next NIR. The ERT agrees with the information presented during the review.
KL.8	HWP – CO_2 (KL.9, 2016) (KL.9, 2015) Transparency	Include information on HWP according to the requirements of decision 2/CMP.8.	Not resolved. The Party has not included all the information required by decision 2/CMP.8, annex II. In particular, it has not included information in relation to paragraphs 2(g)(iii), (iv), (vi) or (vii). Information in relation to paragraph 2(g)(i) is not provided in relation to KP-LULUCF (although it is provided under chapter 6 of the NIR for the LULUCF sector) and does not include information on the proportions of domestically consumed and exported HWP. During the review, the Party provided the missing information and explained that it intends to report it in the next inventory submission. The ERT agrees with this information.

[a] References in parentheses are to the paragraph(s) and the year(s) of the previous review report(s) where the issue and/or problem was raised. Issues are identified in accordance with paragraphs 80–83 of the UNFCCC review guidelines and classified as per paragraph 81 of the same guidelines. Problems are identified and classified as problems of transparency, accuracy, consistency, completeness or comparability in accordance with paragraph 69 of the Article 8 review guidelines, in conjunction with decision 4/CMP.11.

IV. Issues identified in three successive reviews and not addressed by the Party

8. In accordance with paragraph 83 of the UNFCCC review guidelines, the ERT noted that the issues included in table 4 have been identified in three successive reviews, including the review of the 2017 annual submission of Czechia, and have not been addressed by the Party.

Table 4
Issues identified in three successive reviews and not addressed by Czechia

ID[a]	Previous recommendation for the issue identified	Number of successive reviews issue not addressed[b]
General		
G.1	Report any changes in the information provided under Article 3, paragraph 14, of the Kyoto Protocol in accordance with decision 15/CMP.1, annex, chapter I.H, and/or further relevant decisions of the CMP	3 (2014–2017)
Energy		
	No such issues for the energy sector were identified	
IPPU		
I.3	Include information in the NIR on the changes in iron and steel processes	4 (2013–2017)

ID[a]	Previous recommendation for the issue identified	Number of successive reviews issue not addressed[b]
I.5	Include in the NIR information justifying why the CO_2, CH_4 and PFC emissions are reported as "NO", together with an explanation of the 'cover salts' (fluxes) method	3 (2014–2017)
I.11	Consistently implement the new methods, data sources and EFs for the estimation of emissions from refrigeration and mobile air conditioning and transparently document the underlying information in the NIR specifying, in particular, from which subcategories (domestic, commercial, industrial and transport refrigeration, mobile and stationary air conditioning) the emissions come and providing documentation on the AD sources, lifetimes and EFs used	3 (2014–2017)
I.12	Describe in the NIR how the percentage of the F-gases captured and the percentage of the F-gases emitted are identified and explain the storage of large amounts of F-gases practised in the country	3 (2014–2017)
I.14	Justify the trend in the emissions of SF_6 from stocks for soundproof windows in the NIR	3 (2014–2017)
I.15	Further investigate any possible other uses of SF_6 (military, scientific or other), and, if they occur, estimate and report these emissions to ensure completeness of the estimates	3 (2014–2017)
Agriculture		
A.1	Enforce the sector-specific QA/QC analysis and report on the category-specific checks and results in the category-specific subchapters of the NIR	3 (2014–2017)
A.3	Correct the erroneous reporting of the values for body weights in the NIR (table 5-4) and transparently describe how time-series consistency is assured in the relevant subchapter of the NIR	3 (2014–2017)
A.6	Provide the data used to estimate the weighted EF for non-dairy cattle on an animal subcategory level in the NIR, including livestock population statistics, body weight, excretion of volatile solids, B_o and AWMS allocation	3 (2014–2017)
A.9	Provide in the NIR all background information on the development of agricultural policies and structures that support the trends in AWMS allocation	3 (2014–2017)
A.19	Improve reporting of indirect emissions from soils by for example harmonizing the reporting of NH_3 emissions to different international bodies or by using well-documented national data	4 (2013–2017)
LULUCF		
L.3	Use the results of the next NFI, when they are available, to estimate the CSC in the dead organic matter pool	5 (2012–2017)
Waste		
W.1	Improve the transparency of the inventory by including in the NIR the information that in Czechia waste legislation was established before the European Union landfill directive and that management conditions of landfills were gradually improving even before 1990, together with a description of the national legislation concerning landfill management practices	4 (2013–2017)

ID[a]	*Previous recommendation for the issue identified*	*Number of successive reviews issue not addressed*[b]
W.2	Improve the transparency of the inventory and include in the NIR waste composition data, including the degradable organic carbon values, for 1950–1989	4 (2013–2017)
W.3	Update the information on waste composition for the years 1950–1989	4 (2013–2017)
W.4	Improve the transparency of the inventory and include in the NIR information regarding the decreasing trend of waste incinerated	4 (2013–2017)
KP-LULUCF		
KL.1	Report the correct notation key "NR" in CRF table NIR-1 for the deadwood pool, which is reported as "NO" in CRF table 5(KP-I)B.1	4 (2013–2017)
KL.2	Improve the tracking of deforested lands, including information on subsequent land-use changes and the management practices applied to them	4 (2013–2017)
KL.3	Improve the tracking of deforested lands, including information on subsequent land-use changes and the management practices applied to them	4 (2013–2017)

[b] The review of the 2016 annual submission was held in conjunction with the review of the 2015 annual submission. Since the reviews of the 2015 and 2016 annual submissions were not "successive" reviews, but were held in conjunction, for the purpose of counting successive years in table 4, 2015/2016 are considered as one year.

V. Additional findings made during the 2017 individual inventory review

9. Table 5 contains findings made by the ERT during the individual review of the 2017 annual submission of Czechia that are additional to those identified in table 3.

Table 5
Additional findings made during the 2017 individual review of the annual submission of Czechia

ID#	*Finding classification*	*Description of the finding with recommendation or encouragement*	*Is finding an issue and or a problem?[a] If yes, classify by type*
General			
G.10	Archiving	During the review, the ERT examined the electronic archiving system, which is mainly composed of spreadsheets from the base year to the most recent reporting year, managed and coordinated by the single national entity, the Czech Hydrometeorological Institute. The ERT noted that the record-keeping for qualitative information (for instance, expert judgments for key parameters used in the uncertainty analysis) that is relevant to inventory development is not well documented, which is not in accordance with paragraph 27 of the UNFCCC Annex I inventory reporting guidelines and paragraph 16(a) of decision 19/CMP.1 in conjunction with decision 3/CMP.11. The ERT recommends that the Party improve the documentation on how qualitative information (e.g. expert judgment) on key parameters (for example, the parameters used in the uncertainty analysis) are generated and improve the archiving of this information in order to improve transparency.	Adherence to the reporting guidelines under Article 7, paragraph 1, of the Kyoto Protocol
G.11	Inventory management	Czechia's GHG inventory preparation is entirely based on Excel spreadsheets. During the review, the Party informed the ERT about its plan to develop an integrated database to facilitate the compilation and reporting of information. However, given the challenges in the development of new data systems, the ERT noted that it might be helpful for the Party to: seek advice on best practices from other Parties that have developed, or are in the process of developing, similar data systems; develop and implement parts of the system in a stepwise manner; and keep the current Excel-based data system intact until the database is verified as fully functioning.	Not an issue/problem
G.12	Follow-up to previous reviews	The ERT noted that the previous ERT recommended that the 2018 review be conducted as an in-country review and indicated several issues on QA/QC, completeness and potential under- and overestimations that, in the opinion of the previous ERT, reflect that the functions pertaining to national inventory arrangements are not fully functional (FCCC/ARR/2016/CZE, annex III, chapter B). The ERT noted that the Party has resolved most of those issues, specifically: (a) QA/QC: ID#s G.5 (resolved), G.6 (not resolved), A.1 (not resolved), A.2 (resolved) and A.13 (resolved); (b) Completeness: ID#s E.13 (not resolved), I.1 (addressing), I.2 (not resolved), I.12 (addressing), I.16 (addressing) and L.3 (addressing); (c) Potential under- and overestimations: ID#s E.3 (resolved), E.4 (resolved), E.5 (resolved), E.6 (resolved), E.7 (resolved), E.8 (resolved), E.11 (resolved), E.12 (resolved), I.8 (resolved), A.16 (resolved), A.17 (resolved), A.18 (resolved), A.20 (resolved) and W.8 (resolved).	Not an issue/problem
G.13	Key category analysis	The Party reported the key category analysis in the NIR (pp.41–43 and annex 1). The ERT noted that the level of category disaggregation for the energy sector is not in accordance with the 2006 IPCC Guidelines (volume 1, chapter 4.2, table 4.1) because the stationary combustion category used by the Party is not a single category but combines several categories: energy industries;	Yes. Adherence to the UNFCCC Annex I inventory

ID[a]	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue and or a problem[29] If yes, classify by type
		manufacturing industries and construction; commercial and residential; and agricultural/forestry/fishing. Furthermore, paragraph 50 d(ii) of the UNFCCC Annex I inventory reporting guidelines indicates that the NIR is to include information on the level of category disaggregation used and the rationale for its use. However, this information is not found in the NIR. During the review, the Party explained that the current approach is the historical approach to the key category analysis used for all previous submissions since 2005. In order to keep the time series consistent, the Party has continued to use it. At the same time, the Party sent the detailed key category analysis calculation spreadsheets to the ERT. The ERT noted an error in the calculations of the emissions from stationary combustion, which the Party acknowledged. The ERT recommends that the Party fully shift to the 2006 IPCC Guidelines methodology when conducting the key category analysis, specifically by providing a more detailed and accurate level of category disaggregation for the energy sector (e.g. further disaggregating stationary combustion into categories 1.A.1 (energy industries), 1.A.2 (manufacturing industries and construction), 1.A.4 (other sectors) and 1.A.5 (other (fuel combustion)), which in addition would make the results comparable with the results of the automatic key category analysis performed by CRF Reporter and reported in CRF table 7). The ERT also recommends that the Party explain in the NIR any relevant changes to the results of the key category analysis after fully implementing the 2006 IPCC Guidelines.	reporting guidelines
G.14	QA/QC and verification	The Party reported on its national inventory arrangements in NIR chapter 1.2 (pp.21–36), including institutional, legal and procedural arrangements, inventory planning, preparation and management, QA/QC and verification plan. However, the ERT could not identify specific procedures for incorporating the feedback from the QA/QC programme. The ERT noted that this is not in accordance with the 2006 IPCC Guidelines (volume 1, chapter 6, p.6.8), which indicate that "as part of the QA/QC plan, it is good practice to accommodate procedural changes and a feedback of experience". During the review, the Party explained that the feedback from the QA/QC process would be used for correction in the case of findings, and if the findings could not be addressed in the current submission, they would be included in the improvement plan. In particular, the Party gives high priority to the findings from the European Union and UNFCCC reviews so that, if possible, they are addressed in the following submission. The ERT recommends that the Party incorporate a specific procedure into the inventory planning process for prompt reflection of QA/QC findings in the new cycle to drive continued inventory improvement, by either making appropriate corrections or providing transparent explanations in the next submission or integrating the feedback into the improvement plan.	Yes. Adherence to the UNFCCC Annex I inventory reporting guidelines
G.15	QA/QC and verification	The Party reported (NIR p.26) that QC procedures used in the GHG inventory comply with IPCC guidelines, including the 2006 IPCC Guidelines and the IPCC good practice guidance for LULUCF. The ERT noted that references to earlier IPCC guidelines, including the IPCC good practice guidance, are also identified in some sectoral sections (e.g. NIR p.328; see ID# L.6 below). The ERT noted that this is not in accordance with the UNFCCC Annex I inventory reporting guidelines (para. 9) since the IPCC good practice guidance for LULUCF and the IPCC good practice guidance are no longer part of the UNFCCC Annex I inventory reporting requirements. During the review, the Party explained that keeping the references to the IPCC good practice guidance for LULUCF was just to acknowledge that most of the methods in the IPCC good practice guidance for LULUCF were integrated into the 2006 IPCC Guidelines.	Yes. Adherence to the UNFCCC Annex I inventory reporting guidelines

ID[a]	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue and or a problem[b]? If yes, classify by type
		The ERT recommends that the Party use the 2006 IPCC Guidelines as the only guidelines in QA/QC procedures and remove all outdated references to earlier IPCC guidelines from the NIR in order to improve transparency and comparability.	
G.16	QA/QC and verification	The ERT noted that the description of QA procedures in NIR chapter 1 is not fully transparent. The NIR (p.31) mentions that QA procedures in Czechia are planned approximately once every three years. During the review, the Party explained that general QA (peer reviews) for each sector is performed each year; the text in the NIR (p.31) means that the International Organization for Standardization audits performed on the whole inventory system are conducted once every three years. More information on bilateral QA reviews was provided during the review. The ERT recommends that the Party include detailed and consistent information on QA procedures in the NIR, including information on the annual QA procedures conducted at the sector level as well as the conduct of audits performed on the whole inventory system once every three years.	Yes. Transparency
G.17	Recalculations	The Party reported recalculations in NIR chapter 10, providing information on recalculations done between the 2014, 2015, 2016 and 2017 annual submissions. The ERT considers that this is not fully transparent since recalculations done between previous submissions (e.g. between the 2014 and 2015 submissions) have been already reviewed by previous ERTs and do not need to be reported and reviewed again (see ID# A.23 below). The ERT recommends that the Party describe only the recalculations done between the previous submission and the current submission. In accordance with paragraph 43 of the UNFCCC Annex I inventory reporting guidelines, the ERT encourages the Party to provide a quantitative discussion of the impact of each recalculation on the level of emissions for each recalculated category.	Yes. Transparency
G.18	Uncertainty analysis	The Party reported uncertainty analysis for all sectors including and excluding LULUCF. The NIR (chapter 1.6, p.44) reports the estimated overall uncertainty by level assessment including LULUCF as 3.72 per cent and the corresponding uncertainty by trend assessment as 2.41 per cent. However, in the NIR (annex 2, pp.436 and 438) these two values are reported as 3.36 and 2.34 per cent, respectively. During the review, the Party explained that the data presented in annex 2 are outdated (i.e. from the 2016 annual submission) and that the data in NIR chapter 1.6 are correct. The ERT recommends that the Party correct the values for the level and trend uncertainty reported in annex 2 and make them consistent with the values reported in NIR chapter 1.6.	Yes. Adherence to the UNFCCC Annex I inventory reporting guidelines
Energy			
E.14	1. General (energy sector)	The ERT identified several technical errors in the information provided in the NIR and the CRF tables. For example, for 2014, NIR table 3-26 reports an incorrect value of CH_4 emissions from solid fuels under category 1.A.1.c.i (0.4821 kt) instead of 0.0613 kt CH_4 as reported in CRF table 1.A(a)s1; for 2015, NIR table 3-63 reports jet kerosene consumption under category 1.A.2.f (non-metallic minerals) (43 TJ) but this consumption is reported under category 1.A.5 in the CRF tables; NIR table A4-3 reports data for crude oil in the energy balance in the wrong row; and AD and emissions for the information item waste incineration with energy	Yes. Adherence to the UNFCCC Annex I inventory reporting

ID[a]	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue and or a problem[20] If yes, classify by type
		recovery were reported as "NO" in CRF table 1.A(a)s4 even though they occur according to the NIR (chapter 3.2.7.2.1). During the review, the Party explained that the technical errors do not have any impact on the emission estimates and the data will be corrected in the next annual submission. The ERT recommends that the Party correct the errors identified: for 2014, in NIR table 3-26 report CH_4 emissions from solid fuels under category 1.A.1.c.i as 0.0613 kt CH_4; for 2015, clarify in the NIR table 3-63 that jet kerosene consumption is reported under category 1.A.5 in the CRF tables; in NIR table A4-3 report data for crude oil in the correct row; and correctly report AD and emissions for the information item waste incineration with energy recovery in CRF table 1.A(a)s4.	guidelines
E.15	Fuel combustion – reference approach – other fossil fuels – CO_2	The ERT noted that the consumption of industrial and municipal waste (non-biomass fraction) is reported in the energy balances for all years and the occurring emissions from combustion of alternative fuels in electricity and heat production plants and cement plants have been reported for the sectoral approach. However, the respective consumption for the reference approach in CRF table 1.A(b) under waste (non-biomass fraction) has been reported as "NO". During the review, the Party explained that in the reference approach only the fossil carbon should be reported and that for waste the fossil carbon should already be included in the feedstock and non-energy use of fuels used for the production of the materials. The Party considers that reporting the non-biomass fraction of waste in CRF table 1.A(b) in the reference approach would lead to double counting of the fossil carbon already included in the feedstock and non-energy use of fuels. However, the ERT considers that the non-biomass fraction of waste should be reported in CRF table 1.A(b) since, according to the 2006 IPCC Guidelines (volume 2, chapter 6.3), feedstock and non-energy use of fuels is excluded from the fuel combustion emissions in the reference approach. The ERT noted that this incorrect reporting in the reference approach does not affect the reporting in the sectoral approach. The ERT encourages the Party to report the non-biomass fraction of the amount of municipal waste and alternative fuels used in electricity and heat production plants and cement plants in CRF table 1.A(b) under waste (non-biomass fraction).	Not an issue/problem
E.16	1.A. Fuel combustion – sectoral approach – all fuels – all gases	The Party reported that for the emission estimates in the energy sector for the latest reported year it is using preliminary data from CzSO (because these are the latest available at the time of compiling the inventory estimations). In some cases additional data corrections were carried out after the preliminary submission on 15 January 2017, but practically all corrected data were incorporated into the final submission by 15 April 2017 (NIR chapter 1.2.3.3, p.24). However, the ERT noted that for 2015 there were still significant differences between the inventory estimates and the final energy balances submitted to the International Energy Agency/Eurostat, mostly owing to the net calorific values of solid fuels in the residential sector (CRF table 1.A(a)s4 reports 30,074 TJ solid fuels for 2015, while International Energy Agency/Eurostat data report 35,118 TJ). During the review, the Party explained that the revisions to the 2015 energy balances were more significant than in previous years. Significant revisions of the AD were implemented by CzSO in the 2015 energy balances owing to the inclusion of additional data sources and the final energy balances were not delivered on time for the final submission. Hence, the usual corrections could not be implemented for the 2017 annual submission. The ERT encourages the Party to make additional efforts to compare the preliminary and final energy balances and, in case significant changes are identified, to incorporate these into the original submission or to submit revised estimates within six weeks	Not an issue/problem

ID#	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue and/or a problem[20] If yes, classify by type
		of the submission due date.	
E.17	1.A.2.f Non-metallic minerals – other fossil fuels – CH_4 and N_2O	The Party reported (NIR chapter 3.2.15.2, p.107) that a variety of alternative solid and liquid fuels are combusted in cement plants. For 2015 the reported consumption was 4,592.66 TJ (NIR p.107; CRF table 1.A(a)s2). The main source of AD are the verified EU ETS reports of plant operators, which are considered more accurate than the national energy balance and provide information on the fossil and biogenic fractions for each alternative fuel used. During the review, the Party explained that, for the emission estimates, only the fossil fraction of the combusted alternative fuels is considered, assuming that the biogenic fraction is reported in the energy balance under the biomass category. However, this assumption could not be confirmed by the ERT. The ERT noted that the quantity of biomass reported under this category in CRF table1.A(a)s2 (83.85 TJ) is much lower than the corresponding biogenic fraction of alternative fuels from the EU ETS reports, which is estimated to be approximately 1,853 TJ. The ERT considers that the CO_2, CH_4 and N_2O emissions from the biogenic fraction of alternative fuels have not been accurately estimated and there is a potential underestimation of approximately 3.6 kt CO_2 eq (for CH_4 and N_2O emissions) and the CO_2 emissions have not been reported in the memo item. The ERT believes that this issue should be considered further in future reviews to confirm there is not an underestimation of emissions. The ERT recommends that the Party revise the estimates and report CO_2, CH_4 and N_2O emissions from the biogenic fraction (CH_4 and N_2O emissions reported under category 1.A.2.f; CO_2 emissions reported as a memo item) of alternative fuels used in non-metallic industry for the whole time series in the next submission.	Yes. Accuracy
E.18	1.A.3 Transport	The Party reported detailed information on methodologies and AD and emission estimates for transport, including domestic aviation, road transportation, railways, domestic navigation and pipeline transport (NIR chapter 3.2.17, pp.114–130). However, the current structure of the chapter presents all the categories simultaneously. In order to improve the transparency of the NIR, the ERT encourages the Party to restructure the transport chapter of the NIR by disaggregating the provided information into separate subchapters for aviation, road transportation, railways, navigation and pipeline transport.	Not an issue/problem
E.19	1.A.3.a Domestic aviation – jet kerosene – CO_2, CH_4 and N_2O	The Party reported that the total jet kerosene consumption is allocated between domestic and international aviation on the basis of expert judgment, with the main criteria being passenger transport (NIR chapter 3.2.17.1, p.116), since the allocation in the energy balance is not correct. During the review, the Party explained that the official data provided by CzSO are reported under domestic aviation for the fuel loaded to Czech aircraft but used for both domestic and international aviation, as well as the fuel used by military, rescue aircraft and others, which is why fuel consumption needs to be reallocated for the inventory estimates. The current methodology for allocating the consumption is based on the domestic and international transport performance (passengers and cargo) converted to tonnes-kilometres, obtained from the transport yearbook (published annually by the Ministry of Transport). The ERT recognizes the need to reallocate the officially reported fuel consumption in the energy balance; however, the ERT considers that the currently applied methodology for the allocation of jet kerosene consumption underestimates the fuel consumption used for domestic aviation. The expected fuel consumption per tonne-kilometre for a domestic flight should be higher than the fuel consumption for international flights, since a significant part of the fuel is consumed during the take-off phase of the flight.	Yes. Accuracy

ID#	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue and/or a problem[a] If yes, classify by type
		Domestic flights in Czechia have a very short cruise flight phase owing to their short distances and thus have a higher fuel consumption per kilometre. The ERT also noted that there is a discrepancy between the number of passengers used in the calculations and the available Eurostat data on the national aircraft traffic data for the five national airports, which indicate higher domestic traffic (data used by the Party indicate around 26,000 domestic passengers for 2015, while Eurostat data on aircraft traffic by main airport indicate around 75,000). The ERT considers that there is a potential underestimation of the GHG emissions from domestic aviation of approximately 2.2 kt CO_2 eq, but noted that this is below the significance threshold of the UNFCCC Annex I inventory reporting guidelines, paragraph 37(b), for the Party (0.05 per cent of national total GHG emissions, or 65.28–63.96 kt CO_2 eq, for 2013–2015), and therefore would not be subject to an adjustment in accordance with decision 22/CMP.1, paragraph 80(b). The ERT recommends that the Party obtain more accurate data on jet kerosene consumption for domestic aviation, following the approaches set out in the 2006 IPCC Guidelines (volume 2, chapter 3.6.1.3), by obtaining either top-down data on jet kerosene consumption from taxation authorities or bottom-up data from surveys of airline companies or air traffic control records (e.g. data from EUROCONTROL, the European Organisation for the Safety of Air Navigation, on the number of domestic and international flights by aircraft type). The ERT notes that the higher fuel consumption per kilometre for domestic flights should be considered in this approach.	
.20	1.A.5.b Mobile – all fuels – CO_2, CH_4 and N_2O	In CRF table 1.A(a)s4, the Party chose to report under subcategory 1.A.5.b.i mobile (other) emissions from agriculture, forestry and fishing; however, in the NIR (p.144) it is stated that the emissions under category 1.A.5.b.i refer to emissions from aviation for the army, State institutions or private air transport. During the review, the Party confirmed that the reporting is correct in the CRF table but wrong in the NIR. The ERT recommends that the Party revise the description of emissions under category 1.A.5.b.i mobile (other) to indicate that they are emissions from agriculture, forestry and fishing and not from aviation by the army, State institutions or private air transport.	Yes. Transparency
IPPU			
I.17	2.B.4 Caprolactam, glyoxal and glyoxylic acid production – N_2O	The NIR (chapter 4.3.4.1) indicates that glyoxal and glyoxylic acid are not produced in the country, and that caprolactam is produced at only one facility. The Party reported constant AD and N_2O emissions for the whole time series 1990–2015 (CRF table 2(I).A-Hs1 reports 0.25 kt N_2O emissions and AD and EF as confidential). However, the methodology for the estimation of N_2O emissions is not described (NIR chapter 4.3.4, pp.184, 191 and 192). The NIR (chapter 4.3.4.2) indicates that AD are not monitored by CzSO and emissions are based on a series of country-specific studies yielding an approximate value for the upper limit of N_2O emissions of 0.25 kt N_2O. This value is reported as N_2O emissions as a constant value for the whole time series 1990–2015. During the review, the ERT consulted all reports and studies conducted on the single production plant. The ERT noted that the estimates are based on the plant production capacity and do not take any abatement technology into consideration. The EF is estimated on the assumption that 2 per cent of NH_3 is converted to N_2O; that is an EF of 5.7 kg N_2O/t caprolactam using the mass balance. The country-specific reports indicate that this EF (5.7 kg N_2O/t caprolactam) could be underestimated since it is not based on real	Yes. Accuracy

ID#	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue and or a problem?[20] If yes, classify by type
		operation conditions of the plant, but use of the EF of 5.7 kg N_2O/t caprolactam is still recommended. The ERT noted that the 2006 IPCC Guidelines indicate a default EF of 9.0 kg N_2O/t caprolactam (volume 3, chapter 3, table 3.5), 57 per cent higher that the EF used by the Party. The ERT believes that this issue should be considered further in future reviews to confirm there is not an underestimation of emissions. The ERT recommends that the Party: (1) explore the possibility of getting additional data directly from the plant (e.g. operating conditions, AD, abatement technology) in order to increase the accuracy of the EF used and the N_2O emissions reported; (2) review the EF used in the estimates for caprolactam production to ensure that emissions are not underestimated; and (3) if necessary, recalculate N_2O emissions from caprolactam production for the entire time series.	
I.18	2.C.1 Iron and steel production – CO_2	During the review, the Party explained in detail the different mass flows of various fuels in different processes in iron and steel production. The ERT noted that this information is not included in the NIR (see ID# I.3 in table 3). The ERT recommends that the Party include a description of the different processes in iron and steel production occurring in the Party to show the different mass flows and the mass balance of inputs and outputs of carbon in each process.	Yes. Transparency
I.19	2.E.1 Integrated circuit or semiconductor – CF_4	The NIR (chapter 4.6.3) refers to "the base year 1997 to 2015". During the review, the Party clarified that mentioning base year here is incorrect, and that the meaning is that emissions started in 1997 for the first time. The ERT recommends that the Party correct the mention of 1997 as the base year in chapter 4.6.3 of the NIR.	Yes. Adherence to the UNFCCC Annex I inventory reporting guidelines
I.20	2.F Product uses as substitutes for ozone-depleting substances – F-gases	The Party reported that F-gas emissions have been estimated using a new model, with the methodology documented in the report by Řeháček (2016) (NIR p.214). The ERT noted that the Řeháček report does not include any reference to the source of the AD or information about the process. It contains only a summary of the approaches used for the emission estimation and data collection. During the review, the Party provided the ERT with supplementary documentation on the new model used, including a more substantive description of the method and the data-collection procedure. The Party explained that the model has to be improved by further developing the estimate of the relative share of each air conditioning equipment type and exploring how to improve the coverage of the survey of all F-gas consumers or distributors in the country to collect more AD and information on the use of F-gases. The ERT considers that the Party is improving its methodology by developing such a model. The Party also explained that it is difficult to assess the stocks from manufacturers in the past and that it will investigate the stocks of gases as part of the ongoing work on the F-gas database for the new model. The Party further explained that an investigation is being conducted to collect data and information for the six subcategories under category 2.F.1. The ERT recommends that the Party report on the new model used and on the methodology for AD collection in order to assure national coverage of all F-gas consumers. The ERT also recommends that the model be disaggregated into submodules for each subcategory in order to improve the transparency of the AD and the EF.	Yes. Transparency

ID#	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue and or a problem[a] If yes, classify by type
I.21	2.F Product uses as substitutes for ozone-depleting substances – PFCs and HFCs	The ERT noted that F-gases are not estimated for the period 1990–1994 (reported as "NO" in the CRF tables). During the review, the Party explained that this gap is caused by a lack of data on F-gases used during that period. The ERT recommends that the Party report a complete time series for emissions of F-gases from 1990, for example by using proxy data from comparable countries or any other method as suggested in chapter 5 of the 2006 IPCC Guidelines. If data are unavailable, temporarily change the notation key from "NO" to "NE". If emissions do not occur, explain this in the NIR.	Yes. Completeness
I.22	2.F.1 Refrigeration and air conditioning – HFCs	The ERT noted that mobile air conditioning emissions from the car fleet currently in use in the country are estimated assuming a lifetime of 12.5 years and a 10 per cent efficiency of recovery. The ERT noted that different online sources indicate different estimates for the average age of personal vehicles in the country, from 8.57 to 14.73 years (see e.g. http://www.radio.cz/en/section/business/average-age-of-czech-cars-exceeds-15-years-used-imports-soar and https://www.eea.europa.eu/data-and-maps/daviz/average-age-of-road-vehicles-6#tab-chart_1). During the review, the Party explained that there is legislation for recovery of HFCs from cars but it is not fully implemented. Furthermore, the Party agreed that 12.5 years is not representative of the current average age of vehicles in the country and that this issue will be investigated with sectoral experts and professionals in order to produce a more appropriate average age. The ERT recommends that the Party investigate the average age of vehicles in the country and the level of implementation of HFC recovery from destroyed cars.	Yes. Accuracy
I.23	2.G.4 Other (other product manufacture and use) – SF_6 and PFCs	The Party reported SF_6 use by research laboratories under category 2.G.4 but only for the years 2004–2006. The notation key "NO" is used for all remaining years. In NIR chapter 4.8.4.1 (p.224) it is reported that emissions of F-gases were not identified in this category for 2015 on the basis of data collected from customs and the expert judgment of the Czech sectoral expert. The ERT recommends that the Party further investigate whether SF_6 was used by research laboratories between 1990–2003 and from 2007 onward, document its findings in the NIR and, if necessary, estimate and report emissions for the whole time series under category 2.G.2.	Yes. Completeness
Agriculture			
A.21	3. General (agriculture)	The ERT noted that there is still erroneous reporting in the NIR text and tables. This leads to an overall transparency problem. During the review, the Party explained that it will make efforts to address this problem in the future. The ERT welcomes this planned improvement and recommends that the Party correct the errors in the NIR, specifically: (a) Switch the headings of the last two columns in NIR table 5-1 (percentage of total GHG emissions including and excluding LULUCF, respectively); (b) Adjust the wording on the share of CH_4 emissions from enteric fermentation in NIR chapter 5.2.1.1 (see ID# A.2 in table 3);	Yes. Adherence to the UNFCCC Annex I inventory reporting guidelines

ID[a]	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue and or a problem?[b] If yes, classify by type
		(c) Report the correct numbers for dairy cows and suckler cows for the 1995–1998 period in NIR table 5-6 (the NIR indicates 20 days but it should be 36 days). Furthermore, the ERT found that a lot of information (e.g. on methodologies, uncertainties, QA/QC and recalculations) is dispersed over the chapter and not allocated to specific subchapters and categories. The ERT encourages the Party to improve the outline of the NIR in order to increase the overall transparency of the reporting.	
A.22	3. General (agriculture)	The ERT noted that in a number of cases the Party reported rounded values in the CRF or NIR tables, which may cause a problem with transparency; for example, the "Allocation (%)" for manure management systems in CRF table3.B(a)s2, the "Fraction of Manure Nitrogen per AWMS (in %)" in NIR table 5-15 and the Nex rates for swine in CRF table3.B(b). The ERT encourages the Party to conduct all calculations using exact values and also to report exact values in the CRF and NIR tables.	Not an issue
A.23	3. General (agriculture)	The Party reported various recalculations in the agriculture chapter of the NIR (chapter 5) as well as in NIR chapter 10.1.1.14. The ERT noted that the information on recalculations is dispersed over the agriculture chapter and not always consistent with the information in NIR chapter 10.1.1.14. For example, the information on recalculations on pages 228 and 229 of the NIR should be moved to the category-specific subchapters if it concerns recalculations that were conducted for the latest annual submission; and information in NIR chapter 5.2.1.3 partially concerns information on recalculations conducted for previous annual submissions but not for the 2017 submission. During the review, the Party confirmed that some of the recalculations described in the NIR referred to recalculations conducted for annual submissions prior to 2017. Finally, the ERT noted that no estimates were provided of the approximate impact of individual recalculations. The ERT recommends that the Party report the recalculations conducted for the current annual submission compared with the annual submission for the previous year in the category-specific subchapters of the NIR and also in NIR chapter 10, and ensure that the information in the two chapters is consistent. If recalculations from previous annual submissions are mentioned, the ERT recommends that the Party clearly indicate for which submission they were conducted. Furthermore, the ERT encourages the Party to provide approximate estimates of the impact of individual recalculations.	Yes. Transparency
A.24	3.A.1 Cattle – CH_4	The Party discounts 65 per cent of the gross energy intake of calves when estimating CH_4 emissions from enteric fermentation. During the review, the Party explained that the respective gross energy is from milk energy that does not lead to any CH_4 emissions. The ERT agrees with this explanation. However, the ERT noted that this procedure might lead to mistakes when estimating Nex rates using the lower gross energy intake rates of non-dairy cattle from CRF table 3.As1 in equation 10.32 of the 2006 IPCC Guidelines. The ERT notes that no errors have been identified in the 2017 annual submission in this regard. The ERT encourages the Party to report the total gross energy intake of non-dairy cattle and a reduced CH_4 conversion rate in CRF table 3.As1 (e.g. applying a Ym of 0 for milk energy, which leads to a weighted Ym of 2.275 per cent for calves, and then reporting an overall weighted Ym for non-dairy cattle in CRF table 3.As1).	Not an issue

ID#	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue and or a problem? If yes, classify by type
A.25	3.B Manure management – CH_4 and N_2O	To estimate CH_4 emissions the Party used the MCF value for solid storage (from table 10.17 of the 2006 IPCC Guidelines (i.e. 2 per cent)), but to estimate N_2O emissions the Party used the N_2O EF for dry lot (from table 10.21 of the 2006 IPCC Guidelines (i.e. 0.02 kg N_2O-N/kg N)). Accordingly, the ERT noted that the AWMS is not applied consistently for the estimation of CH_4 and N_2O emissions for non-liquid manure storage but this does not result in underestimation of emissions. The ERT recommends that the Party use consistent parameters for manure management of solid manure when estimating CH_4 and N_2O emissions from manure management, or provide the rationale for using default values for different AWMS in the NIR.	Yes. Accuracy
A.26	3.B Manure management – CH_4 and N_2O	Noting the explanations provided by the Party during the review of the trends in AWMS allocation (see ID# A.9 in table 3), the ERT encourages the Party to provide more detailed information on data sources and how information is acquired on AWMS allocation (e.g. via questionnaire, literature review or interviews). The ERT also encourages the Party to update the reported AWMS distribution for the years after 2010, because the most recent expert judgment on the distribution of manure management systems was obtained in 2011.	Not an issue/problem
A.27	3.B Manure management – CH_4 and N_2O	The Party reported in NIR table 5-16 data on Nex for non-cattle livestock that are based on national data for typical animal mass and equation 10.30 of the 2006 IPCC Guidelines. The ERT noted that, for default Nex rates per 1,000 kg animal mass, the Party used the values for Western Europe for sheep and horses but the values for Eastern Europe for swine (table 10.19 of the 2006 IPCC Guidelines). However, the NIR does not provide any rationale for the selection of these region-specific parameters. Furthermore, the ERT noted that, for the reporting of CH_4 emissions from manure management of swine, the default value for market swine for Western Europe from table 10.14 of the 2006 IPCC Guidelines was used. During the review, the Party confirmed this finding and stated that the region-specific parameters for Nex rates per 1,000 kg animal mass were intentionally selected in this way. Furthermore, the Party explained that, according to several expert consultations, Czechia's farming of swine is similar to that in Eastern Europe. The ERT recommends that the Party use the default values for the same region (either Western or Eastern Europe) from the 2006 IPCC Guidelines in estimating CH_4 and N_2O emissions from manure management of swine. Furthermore, the ERT recommends that the Party provide in the NIR the rationale for the use of the region-specific parameters.	Yes. Accuracy
A.28	3.B.2 Sheep – N_2O	The Party reported Nex for sheep in CRF table 3.B(b). For 2008, the total Nex amounts to 3,672,360 kg N. The ERT estimated the total Nex for sheep in 2008 by multiplying the number of sheep (183,618) by the animal-specific Nex rate per head (16.1 kg N/head) and calculated a total amount of Nex of 2,956,250 kg N. During the review, the Party acknowledged the error for 2008 and stated that there was a mistake in the respective spreadsheet. The ERT recommends that the Party correct the erroneous reporting of Nex for sheep for 2008 and report the correct value in CRF table 3.B(b).	Yes. Accuracy
A.29	3.B.3 Swine – CH_4 and N_2O	The Party estimated CH_4 and N_2O emissions from manure management of swine using a tier 1 method. Previous ERTs recommended that the Party consider swine a significant species for manure CH_4 emissions and apply a higher-tier estimation method. However, the present ERT considers that the contribution of swine to the emissions from manure management (30 and 10	Yes. Adherence to the UNFCCC Annex I inventory

ID#	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue and/or a problem? If yes, classify by type
		per cent to CH_4 and N_2O emissions from manure management, respectively; see ID# A.15 in table 3) does not make swine significant. The ERT noted that the 2006 IPCC Guidelines (volume 3, chapter 10, footnote to decision trees 10.3 and 10.4) provide a rule of thumb and not a strict threshold. During the review, the Party explained that it plans to apply a higher-tier method for the estimation of CH_4 and N_2O emissions from manure management of swine for future annual submissions. The ERT welcomes this planned improvement. The ERT recommends that the Party include its plans to apply a higher-tier method for the estimation of CH_4 and N_2O emissions from manure management of swine in the inventory development plan with a specific timeline.	reporting guidelines
A.30	3.B.3 Swine – N_2O	The Party reported in NIR table 5-16 data on Nex for non-cattle livestock for 2015. The Nex of swine is given as 16 kg/head/year, which is based on a typical animal mass of 59 kg. Considering the data in CRF table 3.B(b), the ERT found that both the Nex rate and the body weight are not constant over the time series. For example, for 1990–2005 the Nex rate and the body weight are 17 kg/head/year and 62 kg, but for 2013–2015 they are 16 kg/head/year and 59 kg, respectively. During the review, the Party explained that the decrease in typical animal mass and Nex rate for swine is mainly a consequence of the food market requirements for low-fat pork. The ERT recommends that the Party provide a rationale for the decrease in typical animal mass and Nex rate for swine in the NIR by explaining that they are mainly a consequence of the food market requirements for low-fat pork and by including any other relevant information.	Yes. Transparency
A.31	3.B.4 Other livestock – CH_4	The Party reported in NIR table 5-13 the EF for manure management of poultry (i.e. 0.173 kg CH_4/head/year). The footnote to NIR table 5-13 indicates that the EF is a weighted average of the EFs for different breeding systems, that is 13 per cent wet and 87 per cent dry systems with EFs of 1.13 kg CH_4/head/year and 0.03 kg CH_4/head/year, respectively. The ERT noted that this is not in accordance with the 2006 IPCC Guidelines (volume 10, chapter 10.4.2, table 10.15); according to the guidelines, the EF for layers (hens that lay eggs) in wet systems should be 1.20 kg CH_4/head/year). The ERT concluded that the Party had underestimated CH_4 emissions from manure management of layers. During the review, the Party estimated that the likely level of the non-reported emissions is 5.29 kt CO_2 eq, 4.88 kt CO_2 eq and 5.12 kt CO_2 eq for 2013, 2014 and 2015, respectively. This is below the significance threshold (in accordance with paragraph 37(b) of the UNFCCC Annex I inventory reporting guidelines) (0.05 per cent of national total GHG emissions, or 65.28–63.96 kt CO_2 eq, for the Party for 2013–2015). Furthermore, the ERT noted that the NIR does not state anything about the occurrence of broilers, which would have a lower EF of 0.02 kg CH_4/head/year. During the review, the Party explained that the error is most likely due to a typo and that it will correct the value in the next annual submission. Furthermore, the Party explained that all emissions from broilers are included in the calculation, but not reported separately since no separate AD are available. The ERT recommends that the Party correct the EF for CH_4 emissions from manure management of poultry (for layers in wet systems), applying the default EF from the 2006 IPCC Guidelines (1.20 kg CH_4/head/year). Furthermore, the ERT encourages the Party to report CH_4 emissions from the manure of broilers and layers separately.	Yes. Accuracy
A.32	3.D Direct and	The Party reported in CRF table 3.D the amount of animal manure applied to soils. The ERT checked whether the amount of N	Yes. Accuracy

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	indirect N_2O emissions from agricultural soils – N_2O	from manure applied to soils is consistent with the reporting of emissions from manure management. For that purpose, the ERT estimated the amount of N in manure applied to soils by taking the total amount of N excreted and subtracting all N volatilized during manure management (NH_3, NOx and N_2O) as well as the amount of N deposited on pasture, range and paddock (leaching from manure management was reported as "NE"). The ERT noted that there is general accordance between the two approaches. However, for 2013 the reported amount of N from manure applied to soils in category 3.D is 87.0 kt N, while the ERT calculations result in 73.5 kt N using the alternative N balance approach described above. Accordingly, the ERT considers that N_2O emissions from agricultural soils for 2013 have been overestimated because the amount of N applied to soils has been overestimated. During the review, the Party explained that there is most probably an error in the calculation sheet and that it will correct the error for the next annual submission. The ERT recommends that the Party report the correct amount of N applied to soils as animal manure for 2013 and ensure consistency between the reporting of N_2O emissions from manure management and from agricultural soils.	
A.33	3.D Direct and indirect N_2O emissions from agricultural soils – N_2O	In relation to ID# A.32 above, the ERT noted that the accordance of the reported amount of N from manure applied to soils in category 3.D and the amount of N estimated with the alternative N balance approach is greater when the N_2O emissions from manure management are not subtracted from the amount of N excreted. During the review, the Party explained that it used values from table 10.22 of the 2006 IPCC Guidelines for estimating the volatilization of N-NH_3 and N-NOx and values from table 10.23 of the 2006 IPCC Guidelines for estimating total N loss from manure management. The ERT noted that this approach is somewhat prone to error and could eventually lead to problems of consistency in the mass balance of N. The ERT encourages the Party to use a consistent N balance approach to estimate the amount of manure N applied to agricultural soils, noting that all N excreted on pasture, range and paddock and all N lost during manure management (NH_3, NOx, N_2O and eventually nitrate and dinitrogen) can be subtracted from the amount of N excreted by the total livestock population.	Not an issue
A.34	3.D.a.2 Organic N fertilizers – N_2O	The Party reported in the NIR (p.245) that the verifiable AD for sewage sludge from CzSO in t dry mass have been available since 2002. Accordingly, the ERT found that N_2O emissions from the application of sewage sludge on agricultural land were reported for the years 2002–2015 only. During the review, the Party reconfirmed that AD on application of sewage sludge have been available only since 2002. Furthermore, the Party stated that the estimation of emissions from sewage sludge is coordinated with the estimation of emissions for the waste sector, under which the amount of sewage sludge generated is estimated. The ERT recommends that the Party further investigate the availability of AD on the application of sewage sludge before 2002 and/or use a proxy method (e.g. as suggested in chapter 5 of the 2006 IPCC Guidelines) to estimate N_2O emissions from the application of sewage sludge to agricultural soils for 1990–2001 (e.g. by calculating the share of total sewage sludge produced that is used in agriculture for the years 2002–2015 and applying this share for the years 1990–2001).	Yes. Completeness
A.35	3.D.a.5 Mineralization/ immobilization associated with	In response to an issue raised during previous reviews, the Party estimated N_2O emissions from the mineralization of soil organic matter in agricultural soils (see ID# A.18 in table 3). The NIR (p.247) explains that the estimates are based on annual amounts of carbon in mineral soils on forest land and grassland converted to cropland. The ERT noted that the same amount of emissions was reported in CRF table 4(III) (e.g. for 2015 the Party reported 0.0167 kt N_2O emissions for category 3.D.a.5 in CRF table 3.D under	Yes. Accuracy

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	loss/gain of soil organic matter – N_2O	the agriculture sector and the same amount for category 4.B.2 land converted to cropland in CRF table 4(III) under the LULUCF sector) and considers that this leads to double counting. Furthermore, the ERT considers that only N_2O emissions from the mineralization of soil organic matter under cropland remaining cropland should be reported in the agriculture sector in accordance with footnote 2 to CRF table 4(III) and footnote 4 to CRF table 3.D (i.e. the Party should not report N_2O emissions from land converted to cropland (category 3.B.2 in CRF table 4(III) under the LULUCF sector). The ERT recommends that the Party report only N_2O emissions from the mineralization of soil organic matter under cropland remaining cropland in category 3.D.a.5 in CRF table 3.D, or, if there is no mineralization of soil organic matter under cropland remaining cropland, use the notation key "NO".	
A.36	3.D.b.1 Atmospheric deposition – N_2O	The Party reported indirect N_2O emissions from atmospheric deposition in CRF table 3.D, estimated using a tier 1 approach based on default parameters from the 2006 IPCC Guidelines ($Frac_{GASM}$ = 0.2 and $Frac_{GASF}$ = 0.1). The ERT noted the issue of harmonizing reporting with the reporting to other international bodies (see ID# A.19 in table 3). The ERT also noted that indirect N_2O emissions from agricultural soils has been identified as a key category and therefore a higher-tier estimation method should be used for this category. The ERT recommends that the Party include the use of a higher-tier method for the estimation of indirect N_2O emissions from atmospheric deposition in its inventory development plan, with an according timetable. The ERT considers that harmonization with the reporting under the Convention on Long-range Transboundary Air Pollution may be a good way forward.	Yes. Adherence to the UNFCCC Annex I inventory reporting guidelines
A.37	3.D.b Indirect N_2O emissions from managed soils – N_2O	The Party reported indirect N_2O emissions from agricultural soils in the NIR (chapter 5.4.2.3) and CRF table 3.D. NIR table 5-24 indicates that for $Frac_{GASM}$, $Frac_{GASF}$ and $Frac_{LEACH-(H)}$ the default factors from the 2006 IPCC Guidelines were used (0.20, 0.10 and 0.30). The ERT calculated the amount of N volatilized and leached using those fractions and the AD provided in CRF table 3.D. The ERT noted that its estimates were lower than the AD reported by the Party for indirect N_2O emissions in CRF table 3.D (for 2015 the ERT estimated 49,081,796 kg N for atmospheric deposition and 157,895,910 kg N for leaching and run-off, while CRF table 3.D reports 59,556,478 kg N and 173,607,934 kg N, respectively). The ERT therefore considers that the Party has overestimated indirect N_2O emissions from manure management. During the review, the Party acknowledged the finding of the ERT and explained that CRF table 3.D was the subject of recommendations and recalculations during previous reviews (including reviews of the European Union). The ERT recommends that the Party correct the erroneous reporting of AD for indirect N_2O emissions from agricultural soils for the time series in CRF table 3.D and revise the respective emission estimates.	Yes. Accuracy
A.38	3.G Liming – CO_2	The Party reported CO_2 emissions from the application of dolomite as "IE" in CRF table 3.G–I. During the review, the Party explained that there are no exact statistics on separate fractions of dolomite and limestone. According to the agricultural experts, limestone dominates in the country. Furthermore, the Party stated that it is possible to say that limestone consumption constitutes around 90 per cent of the total consumption. The ERT noted that, since the application of dolomite cannot be excluded and the EF for dolomite is higher (i.e. 0.13 t carbon/t dolomite) than the EF for limestone (i.e. 0.12 t carbon/t limestone), the Party has underestimated CO_2 emissions from liming. During the review, the Party estimated that the likely level of the non-reported	Yes. Accuracy

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		emissions is 1.13, 1.25 and 1.36 kt CO_2 eq for 2013, 2014 and 2015, respectively. This is below the significance threshold (in accordance with paragraph 37(d) of the UNFCCC Annex I inventory reporting guidelines) for the Party (0.05 per cent of national total GHG emissions, or 65.28–63.96 kt CO_2 eq, for 2013–2015).	
		The ERT recommends that the Party estimate the emissions from the application of dolomite separately under category 3.G liming using the appropriate EF.	
LULUCF			
L.6	4. General (LULUCF)	The Party made references in the NIR to the IPCC good practice guidance for LULUCF, including in relation to uncertainty assessment for forest land remaining forest land (p.270), source data compilation (p.256) and the recalculation of growth and yield models for forest land (p.264). There are also various references to those guidelines when the 2006 IPCC Guidelines would be the appropriate reference (e.g. on p.267 of the NIR). The NIR (p.268) states that the reporting for category 4.A.2 follows the recommendations of the IPCC good practice guidance for LULUCF as well as the 2006 IPCC Guidelines. During the review, the Party explained that this was not an issue of adherence to the UNFCCC Annex I inventory reporting guidelines, which require use of the 2006 IPCC Guidelines, because the appropriate methods from the 2006 IPCC Guidelines were applied. The Party explained that the references to the IPCC good practice guidance for LULUCF in the NIR only identified consistency between the IPCC guidance or instances where subsequent guidance built on previous guidance, or was an imprecise description of IPCC good practice.	Yes. Transparency
		The ERT recommends that the Party review all references in the NIR to the IPCC good practice guidance for LULUCF and confirm that the methods and factors applied in these instances are consistent with the 2006 IPCC Guidelines. The ERT also recommends that the Party remove additional references to the IPCC good practice guidance for LULUCF to improve transparency and comparability and to avoid potential confusion regarding the application of up-to-date methods and factors from the 2006 IPCC Guidelines.	
L.7	4. General (LULUCF)	The Party reported that country-specific soil carbon reference stocks were used that are based on soil carbon mapping for forest land, cropland and grassland, as shown in the NIR (figure 6-10, p.270). However, the Party did not include in the NIR numerical information on the actual stocks used in the calculations. During the review, the Party reported the area-weighted average carbon stocks in mineral soils for 2015.	Yes. Transparency
		The ERT recommends that the Party include in the NIR details of the area-weighted average carbon stocks in mineral soils for the reporting year for categories 4.A, 4.B and 4.C.	
L.8	4. General (LULUCF)	The ERT noted that, although AD and parameters such as harvest drain, biomass carbon expansion factor and carbon fractions were reported for estimating biomass CSCs in forest land remaining forest land in NIR tables 6-5 and 6-6, similar transparent information was not always included for other sectors regarding AD, EFs and the rationale for the selection of EFs. Specifically, AD values were not clearly reported in the NIR (p.267) for biomass burning on forest land remaining forest land or for reference carbon stocks for cropland, grassland and forest converted to other land uses (see ID# L.7 above). The ERT considers that EFs and	Yes. Transparency

ID[a]	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue and or a problem?[b] If yes, classify by type
		the rationale for choosing them were not clearly reported in the NIR for: biomass burning on forest land remaining forest land (p.267); soil CSC factors (F_{MG}, F_{LU} and F_I) for cropland remaining cropland and grassland remaining grassland (pp.274 and 278, respectively); biomass on grassland after conversion (p.278); and uncertainty values for forest land remaining forest land (p.271). During the review, the Party provided additional details on the calculations and rationale for the choice of EFs. The ERT recommends that the Party include in the NIR a table of AD and EF parameters for each category for which tier 1 calculations are applied (and where higher-tier approaches are used, provide average or country-specific factors instead), including the rationale for choosing the parameters.	
L.9	Land representation	The Party reported in the NIR (chapter 6.2.2) that the land representation system is based on detailed cadastral information provided by the Czech Office for Surveying, Mapping and Cadastre and that the land-use definitions are based on reporting classifications used by the latter. During the review, the Party provided detailed explanations of the definitions of land uses under the Czech cadastral system and how these are linked to the land-use classifications of the 2006 IPCC Guidelines. The ERT encourages the Party to include a more detailed explanation of cadastral land-use categories and the links to IPCC land-use categories in the NIR (chapter 6.2).	Not an issue/problem
L.10	4.A Forest land – CO_2	The NIR (pp.260 and 261) explains that the area of forest land reported under category 4.A.1 forest land remaining forest land includes areas of forest that are temporarily unstocked. Such areas are either reported as clear-cut areas or as other 'permanently unstocked' forest areas, which do not meet the forest thresholds, based on the national definition of timberland in the Czech Forestry Act 84/1996 (areas of forest land used as the basic areal unit for mandatory forest reporting under FMPs). During the review, the Party explained that the estimates of biomass carbon stock reflect only the actual area of standing forests, because they are based on a bottom-up standwise inventory of the FMP data, including the coverage of all forests including protected areas, minimum reporting scale and reporting of clear-cut areas and young forest stands. The ERT recommends that the Party include a more detailed description of the bottom-up FMP reporting of forest data collection under Czech legislation in the next NIR, clarifying that temporarily unstocked areas are not included in the estimates.	Yes. Transparency
L.11	4.A.1 Forest land remaining forest land – CO_2	In the estimations of CSC for living biomass, the Party did not disaggregate between biomass losses due to wood removals, fuelwood and disturbances on forest land remaining forest land, while in equation 2.11 of the 2006 IPCC Guidelines (volume 4, chapter 2) these sources of biomass loss are separately estimated. The Party explained in the NIR (p.266) that the AD for harvesting were adjusted using a country-specific factor to account for associated harvest losses between merchantable standing wood volumes in the forest and the recovered products as reported by CzSO (i.e. products entering processing facilities or retail destinations) and to reflect the impact of disturbances on sanitation and salvage logging and any fuelwood removals from residues. The ERT recommends that, to improve the transparency and comparability of the reporting, the Party separately report the CSCs in forest land caused by disturbances and the CSCs due to other biomass losses. For example, the Party could include a table in the NIR that separately reports the losses due to planned harvest and due to disturbances (salvage and sanitation harvesting) by disturbance type. The ERT also recommends that the Party separately identify in the NIR the share of carbon stock losses that is	Yes. Comparability

ID[a]	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue and/or a problem[29] If yes, classify by type
		included in reported production (arriving at processing facilities or retail destinations) and the estimated share of additional harvest losses between the forest and processing facilities (e.g. as two separate components of the 'annual harvest drain' shown in figure 6-8 of the NIR).	
L.12	4.A.1 Forest land remaining forest land – CO_2	The Party reported in the NIR (pp.263–266) that it uses AD on harvest volumes to estimate biomass losses due to disturbances, similar to equations 2.12 and 2.13 of the 2006 IPCC Guidelines (volume 4, chapter 2). However, the ERT noted that the 2006 IPCC Guidelines (equation 2.11) indicate that disturbance areas should be used in these estimations. During the review, the Party explained that it used AD on harvest volumes owing to the lack of spatially explicit information on disturbances, which often occur in small, localized patches, for example due to insect or fungal infestations. The Party also explained that there are legal requirements to identify and prioritize sanitation and salvage logging following disturbances, ahead of planned harvest operations. The Party explained that, because of this legal requirement, the reporting of salvage logging provides a complete estimate of disturbances. The Party also explained that prescribed burning of harvest residues does not occur. The ERT recommends that the Party provide additional information in support of the estimates of biomass losses due to disturbances using AD on harvest volumes and not disturbance areas, for example by including in the NIR: (a) A description of common types of disturbance occurring in the Party, including a qualitative or quantitative description of their relative frequency; (b) A description of harvesting practices in salvage and conventional harvesting operations; (c) An indication of the uncertainty of the estimate of additional harvest losses (as defined on p.266 of the NIR); (d) A description or results of any verification of the estimates of total harvest drain, for example by comparison with independent data from CzechTerra or official statistical reporting by CzSO.	Yes. Transparency
L.13	4.A.1 Forest land remaining forest land – CO_2	The Party reported in the NIR (p.266) that losses due to disturbances related to salvage harvesting were estimated using a country-specific factor to account for harvest losses or the difference between products recovered through harvesting and the estimated standing biomass stocks in the forest. The ERT considers that this is similar to the disturbance matrix described in table 2.1 of the 2006 IPCC Guidelines (volume 4, chapter 2). The ERT recommends that, in order to improve comparability and transparency, the Party justify in the NIR the estimates of additional harvest loss, for example by using a version of the disturbance matrix shown in table 2.1 of the 2006 IPCC Guidelines, noting that the matrix could be simplified to reflect only the relevant pools included in the reporting and that the matrix should show for planned and salvage harvest operations the modelled average proportion of growing stock transferred to wood products and to dead organic matter (and indicate if the dead organic matter proportion was assumed in effect to be instantaneously oxidized, in accordance with the tier 1 reporting methodology).	Yes. Comparability
L.14	4.A.1 Forest land	The Party reported that forest land remaining forest land is a key category and that biomass is a significant pool. While the Party applied a higher-tier method for estimating the biomass pool, it applied the tier 1 assumption of no net change in dead organic	Yes. Accuracy

ID[a]	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue and or a problem?[b] If yes, classify by type
	remaining forest land	matter (deadwood and litter) and soil organic carbon stocks. During the review, the Party explained that the deadwood, litter and soil pools are not significant and therefore a higher-tier estimation method is not required. However, the ERT considers that additional evidence of the likely insignificance of these pools should be provided in the NIR. The ERT noted that such evidence was described in the NIR (pp.371 and 372) in relation to the corresponding KP-LULUCF activity of FM to demonstrate that these pools are not a net source, and this information could also be used to assess the significance of these pools to determine the appropriate tier for forest land remaining forest land. During the review, the Party explained that information is now available from the auxiliary data sources described in the NIR (p.261) to estimate CSC in the dead organic matter pool, and that this information was already used to estimate initial biomass stocks in forest land converted to other land uses. Noting the Party's intention to use auxiliary data to estimate emissions from deadwood and litter (see ID# L.3 in table 3), the ERT recommends that the Party use the data to estimate CSC in deadwood and litter. Alternatively, the ERT recommends that the Party review and document in the NIR the likely significance of the deadwood and litter pools. The ERT also recommends that the Party review and document in the NIR the likely significance of the soils pool.	
L.15	4.B.1 Cropland remaining cropland – CO_2	For the purpose of estimating emissions from soil organic carbon in mineral soils, the Party reported in the NIR (p.274) that it stratifies cropland remaining cropland into two categories: conventionally managed cropland and cropland registered as qualifying for 'ecological agriculture'. The Party also reported that it applies a country-specific value for F_{MG} (1.1035) to registered ecological agriculture areas, and a value for F_{MG} of 1.0 to conventional cropping areas. The NIR indicates that the values for the other relative stock change factors (F_{LU} and F_I) are set to 1.0. During the review, the Party explained that the category cropland remaining cropland includes different land uses and management activities, including arable cropping areas, hop fields, vineyards and orchards, and that the broad category of ecological agriculture includes a range of tillage practices and inputs. The ERT noted that this level of stratification of cropland by two management regimes (conventionally managed agriculture and ecological agriculture) is not in accordance with the 2006 IPCC Guidelines (volume 4, chapter 5.2.3.3) as it does not reflect the specific management practices occurring. During the review, the Party described the significant changes in the country's agricultural practices over the time series, including intensive agricultural production in the 1980s (which may have depleted carbon stocks over time, leading to lower starting carbon stocks in 1990), contemporary conventional cropping practices since the 1990s, and the increasing uptake of ecological agricultural practices since the 2000s. The ERT considers that the changes in agricultural practices from intensive agricultural production to conventional agricultural practices and ecological agriculture may be better reflected through the choice of relevant default relative stock change factors (as described in table 5.5 of 2006 IPCC Guidelines, volume 4, chapter 5), depending on the AD on management activities on cropland remaining cropland, rather than by using a single value for F_{MG}, F_{LU} and F_I for conventional cropping and a single value for F_{MG} for ecological agriculture. The ERT recommends that the Party implement a more disaggregated stratification of cropland remaining cropland by land use (F_{LU}) using cadastral information, and develop a more disaggregated classification of management systems (F_{MG}) and rates of input (F_I) in accordance with the guidance on the choice of AD in the 2006 IPCC Guidelines (volume 4, pp.5.19 and 20). The ERT also recommends that the Party select appropriate relative stock change factors from table 5.5 of the 2006 IPCC Guidelines to reflect the	Yes. Accuracy

ID#	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue and or a problem?[20] If yes, classify by type
		actual land use, tillage and input rates for pre-1990 intensive agricultural production (which will affect initial carbon stocks in 1990 and therefore the trend in CSC over the reporting period), contemporary conventional agricultural practices and ecological agriculture.	
L.16	4.C.1 Grassland remaining grassland – CH_4 and N_2O	The Party reported in the NIR (p.278) that CH_4 and N_2O emissions from grassland remaining grassland are not relevant in the country, but did not provide a transparent explanation ("NO" is reported in the corresponding CRF tables). During the review, the Party clarified that: (1) biomass burning does not occur on grassland; (2) N mineralization and immobilization and indirect N_2O emissions from N leaching and run-off do not occur because soil carbon stocks are reported to be increasing throughout the time series; and (3) for drainage and rewetting of organic and mineral soils, estimating CH_4 and N_2O emissions is not mandatory because the methods come from the Wetlands Supplement. The Party explained that there is a planned improvement to use new, spatially explicit AD on biomass burning, which may contain more detailed information on biomass burning for non-forest reporting categories. The ERT recommends that the Party provide a transparent description in the NIR of why CH_4 and N_2O emissions are not reported for grassland remaining grassland, explaining that they do not occur in the country. The ERT encourages the Party to implement the planned improvement regarding AD for biomass burning, including reassessing the requirement to report biomass burning on grassland if this activity occurs in the future. The ERT encourages the Party to reassess the requirement to report CH_4 and N_2O emissions if there are any recalculations of soil CSCs for category 4.C.1. The ERT further encourages the Party to implement methods from the Wetlands Supplement to estimate emissions and removals from drainage and rewetting.	Yes. Transparency
L.17	4.C.1 Grassland remaining grassland – CO_2	For the purpose of estimating emissions from soil organic carbon on mineral soils, the Party reported in the NIR (p.278) that it stratifies grassland remaining grassland into two categories: conventionally managed grassland and grassland areas registered as 'ecological agriculture'. The NIR explains that the Party applies a country-specific value for F_{MG} to registered ecological agriculture areas, and a value for F_{MG} of 1.0 to conventional grassland, and that the values for the other relative stock change factors (F_{LU} and F_I) are set to 1.0. During the review, the Party explained that the category grassland includes different land uses and management activities, and that the broad category of ecological agriculture includes a range of tillage practices and inputs. The ERT noted that this level of stratification of grassland by two management regimes (conventionally managed grassland and grassland areas registered as ecological agriculture) is not in accordance with the 2006 IPCC Guidelines (volume 4, chapter 6.2.3.3) as it does not assign, where possible, appropriate general management regimes (degraded, native or improved) or specific management activities (e.g. fertilization or grazing intensity). During the review, the Party described the significant changes in the country's agricultural practices over the time series (see ID# L.15 above). The ERT recommends that the Party review the two-class stratification (i.e. ecological agricultural projects and conventionally managed grassland) for grassland remaining grassland by land use (F_{LU}) and demonstrate that it is in accordance with the guidance provided in the 2006 IPCC Guidelines (volume 4, chapter 6), and develop a more disaggregated classification of management systems (F_{MG}) and rates of input (F_I) in accordance with the guidance on the choice of AD in the 2006 IPCC Guidelines (volume 4, p.6.17–19). The ERT also recommends that the Party select appropriate relative stock change factors from table 6.2 of the 2006	Yes. Accuracy

ID[a]	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue and or a problem?[a] If yes, classify by type
		IPCC Guidelines (volume 4, chapter 6) to reflect the actual management and input rates for conventional and ecological agriculture.	
L.18	4.D Wetlands	The Party reported in the NIR (p.281) that it does not estimate emissions from wetlands remaining wetlands because they are not significant. Currently all wetland areas are reported under category 4.D.1.3 other wetlands remaining other wetlands and 4.D.2.3 land converted to other wetlands in the CRF tables, and CSC on other wetlands remaining other wetlands is reported as "NO". During the review, the Party explained that the cadastral definition of wetlands mostly comprises flooded lands, riverbeds, lakes, ponds, wetlands proper and swamps, for which no estimation methods are provided in the 2006 IPCC Guidelines and no estimates are required. The Party also explained that peat extraction does not occur in the country. The ERT recommends that the Party explain in the NIR which IPCC wetlands subcategories (flooded land and peat extraction lands) are not estimated and the reason for not estimating them (e.g. because no guidance is provided in the 2006 IPCC Guidelines or because they are not occurring). Or, if subcategories are not estimated because the Party considers that the emissions are insignificant, the ERT recommends that the Party provide a calculation of the likely level of emissions to demonstrate that they are below the significance threshold described in paragraph 37(b) of the UNFCCC Annex I inventory reporting guidelines. For categories for which emissions or removals are occurring but the Party has not estimated them, the ERT recommends that the Party report them as "NE" in the CRF tables. The ERT also recommends that the Party more transparently explain the definition or criteria applied under the cadastral subcategories used in the national definition of wetlands and the procedure for allocating these to the IPCC definitions. For example, this could include more complete description of the definition of "lakes" and "ponds" (whether these include both natural features and those flooded by human activity) and descriptions for the cadastral categories of wetlands and swamps in order to support their allocation to the IPCC wetlands categories of flooded lands, peat extraction or other wetlands. The ERT encourages the Party to include in the NIR a description and breakdown of the lands included under wetlands, and report areas for the categories flooded land remaining flooded land and peat extraction lands. The ERT also encourages the Party to consider the non-mandatory methods for estimating CH_4 emissions from flooded lands remaining flooded lands described in the 2006 IPCC Guidelines (volume 4, annex 3) and any relevant methods from the Wetlands Supplement for other wetland areas.	Yes. Transparency
L.19	4.E.2 Land converted to settlements – CO_2	The Party did not report CSC in mineral soils for land converted to settlements (reported as "NO" in CRF table 4.E.2). The ERT noted that this is not consistent with the 2006 IPCC Guidelines (volume 4, chapters 8.3.3.1 and 8.3.3.3), which provide guidance and tier 1 methods for estimating soil CSC for this reporting category. During the review, the Party explained that the reporting of "NO" was because of lack of information on soils in settlements and the highly diverse land uses included under settlements, such as mining, industrial and residential areas. The Party also explained that recent statistical data from the Czech landscape survey may be available to calculate the country-specific proportion of green space within settlements to assist with choice of EFs in accordance with the 2006 IPCC Guidelines (volume 4, chapter 8.3.3.2). The ERT noted that transparently reported expert judgment may be applied to the choice of EFs where country-specific data are not available. The ERT recommends that the Party estimate CSC for soil organic carbon in mineral soils for land converted to settlements, either on the basis of an estimated proportion of green space within settlements and the broad cadastral land-use categories and default	Yes. Completeness

ID	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue and/or a problem[a] If yes, classify by type
		stock change factors provided in the 2006 IPCC Guidelines (p.8.24) or using country-specific information on settlement land uses.	
Waste			
W.9	5. General (waste)	The NIR generally provides clear descriptions of the estimation methodologies used for the categories in the waste sector by including tables and figures, which helped the ERT to understand them. The ERT commends the Party's efforts in this regard. However, the ERT noted some erroneous reporting in the NIR: inconsistent reporting of CH_4 oxidized in table 7-6 (p.295) (CH_4 oxidized constitutes 10 per cent of the CH_4 generated in 1990–2010 but lower in 2011–2015); incorrect unit provided for biochemical oxygen demand in table 7-15 (p.305) (it should be g/person/day not g/person/year); and inconsistent descriptions related to recalculations (chapter 7.4.1.5 indicates that no recalculations were conducted for waste incineration but it is indicated on p.301 that the 2005–2014 timeline was recalculated to correspond to the official statistics). During the review, the Party acknowledged these issues and explained that these were mostly caused by mistakes when updating the NIR. The Party also explained that it will correct the errors for the 2018 annual submission. The ERT recommends that the Party correct the errors identified in the NIR: inconsistent reporting of CH_4 oxidized in table 7-6 (p.295) (CH_4 oxidized constitutes 10 per cent of the CH_4 generated in 1990–2010 but lower in 2011–2015); and incorrect unit provided for biochemical oxygen demand in table 7-15 (p.305) (it should be g/person/day not g/person/year); and ensure the consistency and accuracy of any discussions on recalculations.	Yes. Adherence to the UNFCCC Annex I inventory reporting guidelines
W.10	5.A.1 Managed waste disposal sites – CH_4	NIR tables 7-2 and 7-3 (pp.291 and 292) report the disposal amount of MSW as AD for the category SWDS. However, there is no explanation of the categorization of the MSW disposed of at the disposal sites. During the review, the Party indicated that the AD for MSW include industrial waste. The ERT noted that the amounts of MSW landfilled reported in the NIR (e.g. 2,570 kt for 2014) are from the ISOH database of the Ministry of Environment and based on a bottom-up approach. However, the ERT also noted that Eurostat data for the Party (http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_wastrt&lang=en) indicate a similar amount of waste disposed but for MSW (reported as "mixed ordinary wastes") excluding industrial waste. For example, for 2014 the Party reported 2,570 kt waste (MSW plus industrial waste), but Eurostat reports 2,500 kt MSW and 3,435 kt total MSW plus industrial waste. The ERT considers that these comparisons seem to indicate that the Party's AD do not include industrial waste for category 5.A.1. During the review, the Party explained that it reports all waste including industrial waste using bottom-up data from the ISOH database; the used data are more reliable than the Eurostat data from CzSO compiled using top-down analysis. The Party also explained that internal discussions with CzSO did not provide further clarification on this matter. The ERT was not able to assess which data are more reliable, but noticed that there are discrepancies between the two data sources, and concludes that the differences should be analysed and explained. The ERT believes that this issue should be considered further in future reviews to confirm that there is not an underestimation of emissions. The ERT recommends that the Party provide sufficient explanation of waste categorization AD, including information on industrial waste, in the NIR. The ERT also recommends that the Party compare the two data sources (ISOH database and Eurostat) as a verification analysis to confirm that the AD reported in the annual submission are complete and include the results of the verification of the data from ISOH in the NIR.	Yes. Accuracy

ID[a]	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue and/or a problem?[a] If yes, classify by type
W.11	5.A.1 Managed waste disposal sites – CH_4	The NIR (p.292) indicates that the Party does not estimate CH_4 emissions from sludge disposal to SWDS. However, the ERT noted that the official Eurostat statistics include data on the amount of sewage sludge disposal (http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_ww_spd&lang=en). The ERT considers that, if occurring, emissions from sludge disposal to SWDS should be reported in the annual submission. During the review, the Party explained that, since sludge disposal to SWDS does not actually occur in the country, the reported disposal amount (from ISOH) does not include any sludge disposal, and the data from ISOH are more reliable than the Eurostat data. The ERT noted that the Eurostat data include six streams for sewage sludge disposal: agricultural use (e.g. 101.64 kt for the Party for 2015), compost and other applications (72.86 kt), landfill (21.46 kt), dumping at sea (0 kt), incineration (14.24 kt) and other (0 kt). The ERT considers that it may be necessary to conduct independently an investigation of the share of sewage sludge disposal streams related to the data from ISOH and to compare with the Eurostat data. The ERT noted the previous recommendation (FCCC/ARR/2012/CZE, paragraph 104) that the Party provide in its next annual submission clear and adequate explanations, including the results of official investigations, of where residual organic matter produced in the anaerobic digestion process is taken and how it is treated, other than its disposal at SWDS. The ERT considers that the Party has not yet sufficiently addressed the issue and that this issue should be considered further in future reviews to confirm that there is not an underestimation of emissions. The ERT recommends that the Party provide in its NIR a description of the investigation of the share of sewage sludge disposal streams related to the data from ISOH, including the verification by comparing with Eurostat data. If there is sewage sludge disposal to SWDS in the country, the ERT recommends that the Party estimate and report CH_4 emissions from sewage sludge disposal.	Yes. Accuracy
W.12	5.B Biological treatment of solid waste – CH_4 and N_2O	This category was identified as a key category for the first time in the 2017 annual submission. The Party estimated CH_4 and N_2O emissions for category 5.B.1 composting using a tier 1 method and reported "NE" for 1990–2004, and estimated CH_4 emissions for category 5.B.2 anaerobic digestion at biogas facilities using a country-specific methodology and a default parameter (leakage ratio). While the 2006 IPCC Guidelines do not include a decision tree to select an estimation method for this category, the ERT considers that the methodologies used to estimate these emissions should be improved now that the activity has been identified as key. During the review, the Party explained the two improvements planned for the category: (1) estimating emissions from composting for before 2005 and from household compost; and (2) reviewing the data sources for emissions before 2007 and verifying the factor used for estimated leakages from digestion facilities, which is crucial for the whole quantification. The ERT recommends that the Party implement the improvements planned for this category (estimating emissions from composting for before 2005 and from household compost, reviewing the data sources for emissions before 2007 and verifying the factor used for estimated leakages from digestion facilities) and explain the recalculations in the NIR.	Yes. Completeness
W.13	5.C.1 Waste incineration – CO_2	The ERT noted that the default value for carbon content provided in the 2006 IPCC Guidelines (volume 5, chapter 5, table 5.2) is on a dry weight basis, but in NIR table 7-12 the Party seems to have reported its estimates for waste incinerated on a wet weight basis, since the parameters reported in that table are for hazardous waste from the IPCC good practice guidance, which uses wet weight in the calculations. The ERT considers that it is necessary to consider dry matter content ratio in the estimations to make	Yes. Accuracy

ID[a]	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue and or a problem?[a] If yes, classify by type
		them in accordance with the 2006 IPCC Guidelines. The ERT noted that the CO_2 emissions are probably overestimated. The ERT recommends that the Party provide information in the NIR on the dry matter content ratio of incinerated waste and explain any recalculation in the NIR.	
W.14	5.D.1 Domestic wastewater – CH_4	The NIR (p.304) states that biogas produced by wastewater treatment plants is converted to TOW required to produce the biogas and is subtracted from collected TOW; collected TOW is divided into two streams, treated TOW and untreated TOW. Since biogas is produced from wastewater treatment, produced biogas is thought to be subtracted only from treated TOW. Also, if biogas is subtracted from collected TOW, biogas reduction in NIR table 7-16 should not be a fraction of treated TOW but of collected TOW and therefore the description in the NIR is inconsistent. During the review, the Party provided the spreadsheets used for the calculation and clarified the description in the NIR but with additional explanation. The ERT noted that the biogas amounts have been correctly subtracted from CH_4 in the calculations for this category. The ERT recommends that the Party provide a more transparent and accurate explanation for the biogas reduction in the NIR (e.g. clarifying in NIR table 7-16 that the biogas reduction is a fraction of collected TOW, not treated TOW).	Yes. Transparency
W.15	5.D.1 Domestic wastewater – CH_4	NIR table 7-16 (p.305) provides the MCFs for the three streams of domestic wastewater treatment (uncollected TOW, untreated TOW and treated TOW). The ERT noted that the NIR does not provide the reason why these MCFs were selected from the 2006 IPCC Guidelines, and that the chosen MCF (0.3) for uncollected TOW is slightly lower than that for anaerobic systems (e.g. 0.5 for latrine (dry climate, communal) or septic system indicated in the 2006 IPCC Guidelines), which are often used at uncollected systems. During the review, the Party explained that, for the MCFs for uncollected TOW, its uncollected treatment system consists mainly of an aerobic system (sump tank), which is essentially a central wastewater treatment plant with a month delay, and house wastewater treatment plants (aerobic). The ERT recommends that the Party justify in the NIR its selection of MCFs for the three streams of domestic wastewater treatment (uncollected TOW, untreated TOW and treated TOW).	Yes. Accuracy
W.16	5.D.1 Domestic wastewater – CH_4	The ERT noted that in NIR table 7-16 (p.305) the Party reported a constant ratio (0.2) for biogas reduction (fraction of treated TOW) for prior to 2002 without any explanation. The ERT recommends that the Party provide in the NIR information justifying the use of a constant ratio for biogas reduction for prior to 2002.	Yes. Transparency
W.17	5.D.2 Industrial wastewater – CH_4	The Party estimated CH_4 emissions from four wastewater streams in the category industrial wastewater (NIR figure 7-9, p.308): (1) river discharge (of untreated wastewater); (2) aerobic treatment (of wastewater); (3) aerobic (treatment of) sludge; and (4) anaerobic (treatment of) sludge. The Party provided in NIR table 7-21 several MCFs (lower bound, default and upper bound) without specifying which were used in the calculations and without justifying the choice. The Party did not provide in the NIR any description of the specific allocation of the MCFs or share of the considered wastewater streams for this category. The ERT recommends that the Party provide in its NIR information on the MCFs used in the estimations. The ERT noted that the	Yes. Transparency

ID#	*Finding classification*	*Description of the finding with recommendation or encouragement*	*Is finding an issue and/or a problem[20] If yes, classify by type*
		Party provided such information in the NIR (table 7-22) of its 2016 annual submission.	
KP-LULUCF			
KL.9	Article 3.3 activities	The Party reported in the NIR (p.364) that the identification of areas subject to KP-LULUCF activities is based on the cadastral information on forest land, but in the LULUCF reporting for forest land (category 4.A) the Party reported (p.261) that the cadastral definition includes areas that have lost forest cover. Such areas are reported as either clear-cut areas or other permanently unstocked forest areas, which do not meet the forest thresholds, on the basis of the national definition of timberland based on the Czech Forestry Act 84/1996 (areas of forest land used as the basic areal unit for mandatory forest reporting under FMPs). The Party reported that deforestation is a permanent cadastral change of land use, but did not report on areas that have lost forest cover but are not yet classified as deforested (NIR chapters 11.4.2 and 11.4.3). The ERT noted that this information was not sufficient to meet the requirements of explaining how forest cover loss is distinguished from deforestation (paragraph 4(b) of annex II to decision 2/CMP.8) and tracking areas of forest cover loss (Kyoto Protocol Supplement, chapter 2.6.2.1, p.2.83). During the review, the Party explained that by law cadastral forest areas cannot be permanently unstocked, and that this term distinguishes longer-term forest activities (such as forest roads and nurseries) from clear-cut areas that are required to be restocked within two years. The Party explained that these longer-term forest activities did not represent a land-use change and would be required to return to forest. The ERT recommends that the Party report in the NIR the area of clear-cut forests that have not yet regained forest cover, and any additional unstocked forest land, and provide information on the proportion that is expected to return to forest cover. The ERT also recommends that the Party provide additional information on the expected periods for regeneration of cadastral forest areas temporarily unstocked.	Yes. Transparency
KL.10	Article 3.3 activities	Noting ID# KL.3, the ERT encourages the Party to include the use of the fully digitized cadastral information in the inventory improvement plan, including a timetable of when the data will be available and when they are expected to be used in the inventory reporting.	Not a problem
KL.11	AR – CO_2, CH_4 and N_2O	The Party reported a clear and transparent reconciliation of the areas of forest reported under the Convention and KP-LULUCF in NIR table 11-2. The ERT commends the Party for providing such information and encourages it to provide a similar reconciliation of estimated emissions and removals, including both FM and AR for KP-LULUCF and the categories 4.A.1 and 4.A.2 and HWP for LULUCF.	Not a problem
KL.12	AR – CO_2, CH_4 and N_2O	The Party reported in the CRF tables for 2015 removals of 589.37 kt CO_2 eq and an area of 58.00 kha for the category AR (4(KP-I)A.1) and removals of 5,075.56 kt CO_2 eq and an area of 2,610.40 kha for FM. Under the Convention (LULUCF sector) the Party reported an area of 2,615.89 kha and 52.51 kha for categories 4.A.1 and 4.A.2, respectively, and removals of 6,892.30 kt CO_2 eq for category 4.A and 164.15 kt CO_2 eq for HWP. The ERT noted that, although the total area of forest reported under the Convention and KP-LULUCF is the same (2,668.39 kha), the estimated removals are different. The ERT noted that Parties are	Yes. Accuracy

ID[a]	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue and or a problem?[a] If yes, classify by type
		encouraged to harmonize their reporting under the Convention and under the Kyoto Protocol (Kyoto Protocol Supplement, p.1.5), and, where KP-LULUCF reporting hierarchies result in differences between the reporting under the Convention and the KP-LULUCF reporting, emissions should be estimated on the basis of the actual use of the land in the year (Kyoto Protocol Supplement, p.2.25 and flow chart in figure 1.1). During the review, the Party explained that it had identified an error in the area-based attribution of biomass CSC to FM, which was the main reason for the difference between the KP-LULUCF and Convention reporting. The Party also explained that there was a second, minor reason for the difference. Under the Convention the Party applies a default transition period of 20 years, but under AR forests planted since 1990 continue to be reported in this category even after 20 years. The Party further explained that it calculated emissions from AR using the methodology for young stands (this is different because FMPs do not include the annual increments for young stands until they have reached merchantable stem diameters), while the forests over 20 years old should be reported on the basis of FMP data consistent with the method applied for forest land remaining forest land. This has resulted in an underestimation of removals for such forests established between 1990 and 1994 (as at 2015). The ERT recommends that the Party correct the error in the attribution of FM area in the biomass carbon stock calculations and improve the QC processes. The ERT also recommends that the Party review the methodological discrepancy between the AR reporting under the Kyoto Protocol and Convention reporting for forests planted since 1990 but greater than 20 years of age, and apply appropriate methodologies. The ERT further recommends that the Party provide additional explanation in the NIR regarding the differences in calculations for above- and below-ground biomass in new forest stands and mature forests, and the reason for these differences, as provided to the ERT during the review. The ERT encourages the Party to investigate the possibility of linking the comprehensive bottom-up FMP database and mapping with the digitized cadastral information to allow fully spatially explicit reporting of forest biomass for KP-LULUCF activities and to avoid over- or underestimation in the future.	
KL.13	FM – CO_2	The Party reported "NO" in CRF table 4(KP-I)B.1 for non-biomass pools; however, in the NIR the Party explained that it intends to exclude those pools from its accounting under paragraph 26 of the annex to decision 2/CMP.7. The ERT noted that the tier 1 assumption of no net change in carbon stocks is not applicable in such instances, in accordance with the Kyoto Protocol Supplement (p.2.34), and therefore the notation key "NO" is not accurate. The ERT also noted that because category 4.A.1 is a key category, FM is also key. The ERT recommends that the Party report as "NE" any pools that it intends to exclude from its accounting under paragraph 26 of the annex to decision 2/CMP.7.	Yes. Comparability
KL.14	FM – CO_2, CH_4 and N_2O	The Party reported that no technical correction has been applied to the FMRL (NIR p.375; CRF table 4(KP-I)B.1.1). However the Party did not provide information in the NIR to demonstrate methodological consistency between the FMRL and the reporting of FM in the second commitment period in accordance with paragraph 2(e) of annex II to decision 2/CMP.8. During the review, the Party explained that it has selected end of commitment period accounting and indicated that it intends to calculate a technical	Yes. Accuracy

ID#	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue and or a problem[a]? If yes, classify by type
		correction of the FMRL prior to the end of the commitment period. The ERT recommends that the Party provide information to demonstrate consistency between the FMRL and the reporting of FM, for example by including in the NIR a table comparing the historical time series used in the construction of the FMRL and the reported emissions for the same historical period from the latest inventory submission. The ERT also recommends that the Party increase the transparency of the demonstration of the methodological consistency between FM and the FMRL by providing additional information on the main drivers of the accounting quantities for FM, in accordance with the Kyoto Protocol Supplement (chapter 2.7.5.2), for example if the increased sink in 2013, 2014 and 2015 relative to the FMRL is caused by a lower harvest rate than applied in the FMRL projection or by a different driver.	
KL.15	FM – CO_2	The Party reported CSC in the litter and mineral and organic soil carbon pools as "NO" in CRF table 4(KP-I)B.1. The Party reported in the NIR (p.372) that these pools are not a net source, on the basis of knowledge of likely system responses as well as using data from forest sampling programmes and with reference to a peer-reviewed study of soil carbon under the Party's FM conditions. The ERT encourages the Party to revise the information provided in the NIR (chapter 11.3.1.2) considering recently available forest sampling data from CzechTerra and use this information to report CSC estimates for litter under FM. The ERT also encourages the Party to apply a soil carbon modelling method to estimate and report soil carbon emissions, for example as described in the soil carbon study of FM lands referenced in the NIR (p.372).	Not a problem
KL.16	FM – CO_2, CH_4 and N_2O	The ERT noted that a number of the conditions identifying the need for a technical correction listed in the Kyoto Protocol Supplement (p.2.100) appear to have been met. For example, the ERT noted there has been a change to the method used to report HWP resulting from deforestation events, which is now on the basis of instantaneous oxidation. The ERT noted that there has also been a change to the pools and gases included in the reporting because CO_2 emissions from liming were included in the FMRL but are now reported under agriculture (category 3.G). There have also been recalculations made to the historical data used to construct the FMRL. During the review, the Party explained that the recalculations contained in the NIR compared with the historical data used to construct the FMRL in table 5 of the 2011 FMRL submission amounted to a mean difference of 2.4 per cent for the biomass pool and the mean difference for emission sources included in the FMRL was 1.5 per cent. The Party indicated that it intends to calculate a technical correction prior to the end of the commitment period (see ID# KL.14 above). The ERT recommends that the Party review the checklist in table 2.7.1 of the Kyoto Protocol Supplement and calculate and report a technical correction to ensure methodological consistency between the FMRL and the reporting on FM in the second commitment period.	Yes. Accuracy

[a] Recommendations made by the ERT during the review are related to issues as defined in paragraph 81 of the UNFCCC review guidelines, or problems as defined in paragraph 69 of the Article 8 review guidelines. Encouragements are made to the Party to address all findings not related to such issues or problems.

VI. Application of adjustments

10. The ERT has not identified the need to apply any adjustments to the 2017 annual submission of Czechia.

VII. Accounting quantities for activities under Article 3, paragraph 3, and, if any, activities under Article 3, paragraph 4, of the Kyoto Protocol

11. Czechia has elected commitment period accounting and therefore the issuance and cancellation of units for KP-LULUCF activities is not applicable for the 2017 review.

VIII. Questions of implementation

12. No questions of implementation were identified by the ERT during the review.

Annex I

Overview of greenhouse gas emissions and removals for Czechia for submission year 2017 and data and information on activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol, as submitted by Czechia

1. Tables 6–9 provide an overview of total GHG emissions and removals as submitted by Czechia.

Table 6
Total greenhouse gas emissions for Czechia, base year[a]–2015
(kt CO_2 eq)

	Total GHG emissions excluding indirect CO_2 emissions		*Total GHG emissions including indirect CO_2 emissions[b]*		*Land-use change (Article 3.7 bis as contained in the Doha Amendment)[c]*	*KP-LULUCF activities (Article 3.3 of the Kyoto Protocol)[d]*	*KP-LULUCF activities (Article 3.4 of the Kyoto Protocol)*	
	Total including LULUCF	*Total excluding LULUCF*	*Total including LULUCF*	*Total excluding LULUCF*			*CM, GM, RV, WDR*	*FM*
FMRL								–4 686.00
Base year	189 344.06	195 831.77	191 465.81	197 953.52	NA		NA	
1990	189 339.37	195 827.08	191 461.11	197 948.82				
1995	147 261.15	155 307.59	149 006.34	157 052.78				
2000	139 419.53	148 224.60	140 575.08	149 380.15				
2010	131 425.78	138 625.85	132 393.21	139 593.28				
2011	128 528.55	136 917.51	129 474.60	137 863.57				
2012	125 008.67	133 561.38	125 913.06	134 465.77				
2013	121 829.55	129 749.79	122 640.95	130 561.18		–258.35	NA	–6 405.31
2014	118 037.53	125 838.63	118 815.22	126 616.31		–318.56	NA	–6 280.87
2015	120 486.14	127 126.83	121 284.84	127 925.53		–409.64	NA	–5 075.56

Note: Emissions/removals reported in the sector other (sector 6) are not included in total GHG emissions.

[a] Base year refers to the base year under the Kyoto Protocol, which is 1990 for CO_2, CH_4 and N_2O and 1995 for HFCs, PFCs, SF_6 and NF_3. Czechia has not elected any activities under Article 3, paragraph 4, of the Kyoto Protocol. For activities under Article 3, paragraph 3, of the Kyoto Protocol, and FM under Article 3, paragraph 4, only the inventory years of the commitment period must be reported.

[b] The Party has reported indirect CO_2 emissions in CRF table 6.

[c] The value reported in this column refers to 1990.

[d] Activities under Article 3, paragraph 3, of the Kyoto Protocol, namely AR and deforestation.

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Table 7
Greenhouse gas emissions by gas for Czechia, excluding land use, land-use change and forestry, 1990–2015
(kt CO_2 eq)

	CO_2[a]	CH_4	N_2O	HFCs	PFCs	*Unspecified mix of HFCs and PFCs*	SF_6	NF_3
1990	163 771.33	23 450.87	10 642.52	NO	NO	NE, NO	84.10	NO
1995	131 482.14	18 032.44	7 449.40	0.32	0.01	NE, NO	88.47	NO
2000	126 943.73	15 221.02	6 829.79	272.92	4.69	NE, NO	107.99	NO
2010	117 126.77	14 242.64	5 746.66	2 348.97	48.01	NE, NO	80.23	NO
2011	114 983.67	14 229.55	5 936.66	2 620.17	8.13	NE, NO	85.39	NO
2012	111 525.64	14 227.09	5 849.26	2 765.99	6.36	NE, NO	89.63	1.80
2013	107 914.32	13 665.65	5 891.47	2 989.02	4.55	NE, NO	92.35	3.82
2014	103 576.87	13 628.21	6 081.60	3 229.53	3.02	NE, NO	94.73	2.35
2015	104 568.45	13 694.48	6 112.73	3 455.08	1.96	NE, NO	90.55	2.29
Per cent change 1990–2015	**–36.1**	**–41.6**	**–42.6**	**NA**	**NA**	**NA**	**7.7**	**NA**

Note: Emissions/removals reported in the sector other (sector 6) are not included in total GHG emissions.
[a] CO_2 emissions include indirect CO_2 emissions reported in CRF table 6.

Table 8
Greenhouse gas emissions by sector for Czechia, 1990–2015
(kt CO_2 eq)

	Energy	*IPPU*	*Agriculture*	*LULUCF*	*Waste*	*Other*
1990	159 846.55	17 827.59	17 049.98	–6 487.71	3 224.71	NO
1995	128 374.15	14 823.15	10 245.64	–8 046.44	3 609.84	NO
2000	121 564.82	15 008.47	8 975.75	–8 805.07	3 831.11	NO
2010	111 898.25	15 201.30	7 761.98	–7 200.07	4 731.75	NO
2011	109 704.11	15 478.16	7 904.13	–8 388.97	4 777.16	NO
2012	106 424.56	15 215.73	7 895.79	–8 552.72	4 929.69	NO
2013	102 019.62	15 193.12	8 128.87	–7 920.23	5 219.57	NO
2014	97 112.44	15 979.47	8 280.62	–7 801.09	5 243.79	NO
2015	98 453.89	15 637.54	8 482.99	–6 640.69	5 351.11	NO
Per cent change 1990–2015	**–38.4**	**–12.3**	**–50.2**	**2.4**	**65.9**	**NA**

Notes: (1) Emissions/removals reported in the sector other (sector 6) are not included in total GHG emissions. (2) Totals include indirect CO_2 emissions reported in CRF table 6.

Table 9

Greenhouse gas emissions/removals from activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol by activity, base year[a]–2015, for Czechia

(kt CO_2 eq)

	Article 3.7 bis as contained in the Doha Amendment[b]	*Article 3.3 of the Kyoto Protocol*		*FM and elected Article 3.4 activities of the Kyoto Protocol*				
	Land use change	*AR*	*Deforestation*	*FM*	*CM*	*GM*	*RV*	*WDR*
FMRL				–4 686.00				
Technical correction				NA				
Base year	NA				NA	NA	NA	NA
2013		–492.61	234.27	–6 405.31	NA	NA	NA	NA
2014		–549.75	231.19	–6 280.87	NA	NA	NA	NA
2015		–589.37	179.73	–5 075.56	NA	NA	NA	NA
Per cent change Base year–2015					**NA**	**NA**	**NA**	**NA**

Note: Values in this table include emissions on lands subject to natural disturbances, if applicable.

[a] Czechia has not elected any activities under Article 3, paragraph 4, of the Kyoto Protocol. For activities under Article 3, paragraph 3, of the Kyoto Protocol, and FM under Article 3, paragraph 4, only the inventory years of the commitment period must be reported.

[b] The value reported in this column refers to 1990.

2. Table 10 provides an overview of relevant key data for Czechia's reporting under Article 3, paragraphs 3 and 4, of the Kyoto Protocol.

Table 10
Key relevant data for Czechia under Article 3, paragraphs 3 and 4, of the Kyoto Protocol

Key parameters	*Values*
Periodicity of accounting	(a) AR: commitment period accounting
	(b) Deforestation: commitment period accounting
	(c) FM: commitment period accounting
	(d) CM: not elected
	(e) GM: not elected
	(f) RV: not elected
	(g) WDR: not elected
Election of activities under Article 3, paragraph 4	None
Election of application of provisions for natural disturbances	No
3.5% of total base-year GHG emissions, excluding LULUCF and including indirect CO_2 emissions	6 941.074 kt CO_2 eq (55 528.593 kt CO_2 eq for the duration of the commitment period)
Cancellation of AAUs, ERUs, CERs and/or issuance of RMUs in the national registry for:	
1. AR in 2015	NA
2. Deforestation in 2015	NA
3. FM in 2015	NA
4. CM in 2015	NA
5. GM in 2015	NA
6. RV in 2015	NA
7. WDR in 2015	NA

Annex II

Information to be included in the compilation and accounting database

Tables 11–13 include the information to be included in the compilation and accounting database for Czechia. Data shown are from the original annual submission of the Party, including the latest revised estimates submitted, adjustments (if applicable) as well as the final data to be included in the compilation and accounting database.

Table 11
Information to be included in the compilation and accounting database for 2015, including on the commitment period reserve, for Czechia
($t CO_2$ eq)

	Original submission	*Revised estimates*	*Adjustment*	*Final*
CPR	495 463 683	468 463 683		468 463 683
Annex A emissions for 2015				
CO_2[a]	104 568 446			104 568 446
CH_4	13 694 478			13 694 478
N_2O	6 112 726			6 112 726
HFCs	3 455 081			3 455 081
PFCs	1 960			1 960
Unspecified mix of HFCs and PFCs	NE, NO			NE, NO
SF_6	90 552			90 552
NF_3	2 288			2 288
Total Annex A sources	127 925 530			127 925 530
Activities under Article 3, paragraph 3, of the Kyoto Protocol for 2015				
3.3 AR	−589 369			−589 369
3.3 Deforestation	179 729			179 729
FM and elected activities under Article 3, paragraph 4, of the Kyoto Protocol for 2015				
3.4 FM	−5 075 556			−5 075 556

[a] CO_2 emissions include indirect CO_2 emissions reported in CRF table 6.

Table 12
Information to be included in the compilation and accounting database for 2014 for Czechia
(t CO_2 eq)

	Original submission	*Revised estimates*	*Adjustment*	*Final*
Annex A emissions for 2014				
CO_2[a]	103 576 870			103 576 870
CH_4	13 628 211			13 628 211
N_2O	6 081 600			6 081 600
HFCs	3 229 528			3 229 528
PFCs	3 020			3 020
Unspecified mix of HFCs and PFCs	NE, NO			NE, NO
SF_6	94 734			94 734
NF_3	2 353			2 353
Total Annex A sources	**126 616 315**			**126 616 315**
Activities under Article 3, paragraph 3, of the Kyoto Protocol for 2014				
3.3 AR	–549 754			–549 754
3.3 Deforestation	231 190			231 190
FM and elected activities under Article 3, paragraph 4, of the Kyoto Protocol for 2014				
3.4 FM	–6 280 872			–6 280 872

[a] CO_2 emissions include indirect CO_2 emissions reported in CRF table 6.

Table 13
Information to be included in the compilation and accounting database for 2013 for Czechia
(t CO_2 eq)

	Original submission	*Revised estimates*	*Adjustment*	*Final*
Annex A emissions for 2013				
CO_2[a]	107 914 322			107 914 322
CH_4	13 665 651			13 665 651
N_2O	5 891 472			5 891 472
HFCs	2 989 017			2 989 017
PFCs	4 546			4 546
Unspecified mix of HFCs and PFCs	NE, NO			NE, NO
SF_6	92 348			92 348
NF_3	3 824			3 824
Total Annex A sources	**130 561 180**			**130 561 180**
Activities under Article 3, paragraph 3, of the Kyoto Protocol for 2013				
3.3 AR	–492 613			–492 613
3.3 Deforestation	234 267			234 267
FM and elected activities under Article 3, paragraph 4, of the Kyoto Protocol for 2013				
3.4 FM	–6 405 305			–6 405 305

[a] CO_2 emissions include indirect CO_2 emissions reported in CRF table 6.

Annex III

Additional information to support findings in table 2

Missing categories that may affect completeness

The categories for which methods are included in the 2006 IPCC Guidelines that were reported as "NE" or for which the ERT otherwise determined that there may be an issue with the completeness of reporting in the Party's inventory are the following:

(a) CO_2 and CH_4 emissions for category 1.B.2.a.1 oil exploration – liquid fuels (see ID# E.13 in table 3);

(b) CO_2 emissions from mineral wool production (1990–1999) under category 2.A.4 other process uses of carbonates (see ID# I.1 in table 3);

(c) CO_2 emissions from soda ash production under category 2.B.7 soda ash production (see ID# I.2 in table 3);

(d) HFC and PFC emissions (1990–1994) for category 2.F product uses as substitutes for ozone-depleting substances (see ID# I.21 in table 5);

(e) PFC and SF_6 emissions from other possible uses of PFCs and SF_6 under category 2.G.2 SF_6 and PFCs from other product use (see ID# I.15 in table 3);

(f) SF_6 emissions from double-glazed soundproof windows under category 2.G.2 SF_6 and PFCs from other product use (see ID# I.16 in table 3);

(g) SF_6 and PFC emissions for category 2.G.4 other (other product manufacture and use) (see ID# I.23 in table 5);

(h) N_2O emissions from sewage sludge applied on agricultural land for 1990–2001 under category 3.D.a.2 organic N fertilizers (see ID# A.34 in table 5);

(i) CSCs in the dead organic matter pool on forest land remaining forest land (see ID# L.3 in table 3);

(j) CSCs in mineral soils for category 4.E.2 land converted to settlements (see ID# L.19 in table 5);

(k) CH_4 and N_2O emissions from composting (1990–2004) for category 5.B.1 composting (see ID# W.12 in table 5);

(l) CSCs in deadwood under FM (see ID# KL.5 in table 3).

Annex IV

Documents and information used during the review

A. Reference documents

Reports of the Intergovernmental Panel on Climate Change

IPCC. 2006. *2006 IPCC Guidelines for National Greenhouse Gas Inventories*. S Eggleston, L Buendia, K Miwa, et al. (eds.). Hayama, Japan: Institute for Global Environmental Strategies. Available at http://www.ipcc-nggip.iges.or.jp/public/2006gl.

IPCC. 2014. *2013 Revised Supplementary Methods and Good Practice Guidance Arising from the Kyoto Protocol*. T Hiraishi, T Krug, K Tanabe, et al. (eds.). Hayama, Japan: Institute for Global Environmental Strategies. Available at http://www.ipcc-nggip.iges.or.jp/public/kpsg.

IPCC. 2014. *2013 Supplement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories: Wetlands*. T Hiraishi, T Krug, K Tanabe, et al. (eds.). Geneva: IPCC. Available at http://www.ipcc-nggip.iges.or.jp/public/wetlands/.

Annual review reports

Reports on the individual review of the 2012, 2013, 2014, 2015 and 2016 annual submissions of Czechia, respectively, contained in documents FCCC/ARR/2012/CZE, FCCC/ARR/2013/CZE, FCCC/ARR/2014/CZE, FCCC/ARR/2015/CZE and FCCC/ARR/2016/CZE.

Other

Aggregate information on greenhouse gas emissions by sources and removals by sinks for Parties included in Annex I to the Convention. Note by the secretariat. Available at http://unfccc.int/resource/webdocs/agi/2017.pdf.

Annual status report for Czechia for 2017. Available at http://unfccc.int/resource/docs/2017/asr/cze.pdf.

Dämmgen U, Rosemann C, Haenel H-D and Hutchings NJ. 2012. Enteric methane emissions from German dairy cows. *Landbauforsch*. (62): pp.21–32.

Řeháček V. 2016. *Anthropogenic Emissions of Fluorinated Greenhouse Gases in the Czech Republic in 2016*. Prague: Report for the Czech Hydrometeorological Institute.

B. Additional information provided by the Party

Responses to questions during the review were received Ms. Eva Krtková (Air Quality Protection Division, Czech Hydrometeorological Institute), including additional material on the methodology and assumptions used.